KV-13EXR90

SERVICE MANUAL

US Model

Chassis No. 5CC-D37A-A

Canadian Model

Chassis No. SCC-D36H-A

P3B CHASSIS

Note: The service manual for RM - 780 / RM - 781 has been issued separately.

MODELS OF THE SAME SERIES	
KV-19TR10	KV-19TS20
KV-19TR20	
KV-19TS10	

SPECIFICATIONS

Television system	American TV standards
Channd coverage	VHP: 2-13
	UHF: 14-69
	Cable TV: 1-125
Picture tube	Mirror black Trinitron tube
	13-inch picture measured diagonally
	14-inch picture tube measured diagonally
Antenna	75-ohm external antenna terminal for VHF/UHF
Input	VIDEO INPUT (phono jacks)
(Only for KV-19TR20)	Video: IVp-p, 75-ohms unbalanced, sync negative
	Audio : SOOmVrms (100% modulation) impedance: 10k ohms
Power requirement!	120V AC, 60Hz
Power coroumption	120W (Max.)
	5W (in standby condition)
Accessories supplied	Remote Commander RM-781
	Remote Commander RM-780 with 2 size AA (R6) batteries
	VHF/UHF telescopic dipde antenna (1) (Only for USA models)
	Antenna connector(1)
Optional accessories	U/V mixer 6AC-66
	Connecting cable VMC-606/607M
	VMC-810/820S
	RK-74A

Speaker Impedance	*Sn*
Speaker Wattage/channel	Approx. 2W
Dimension*	Approx. 500X455X463mm(w/h/d)
Weight	Approx. 16.3kg

Designs and specifications are subject to change without notice.

MICROFILM

TRINITRON-COLOR TV

SONY

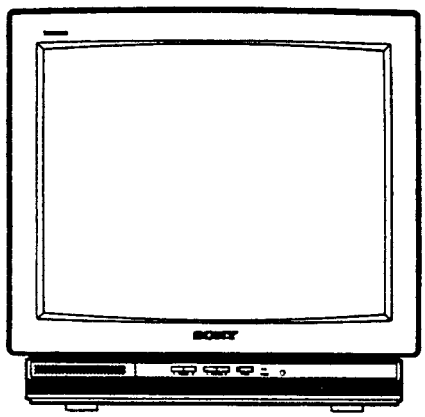
KV-19TR10/19TR20
RM-780/RM-781

SERVICE MANUAL

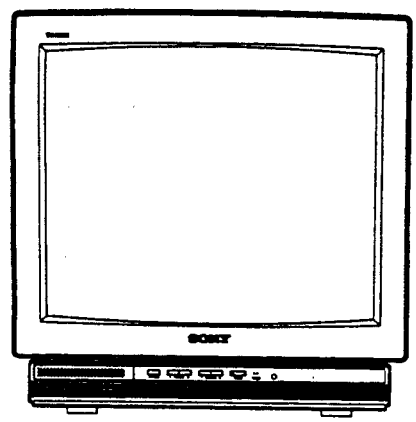
6395

US Model
KV-19TR10
Chassis No. SCC-D37E-A
KV-19TR20
Chassis No. SCC-D37F-A

Canadian Model
KV-19TR10
Chassis No. SCC-D36C-A
KV-19TR20
Chassis No. SCC-D36B-A



KV-19TR10



KV-19TR20

P-3B CHASSIS

Note: The service manual for RM-780 / RM-781 has been issued separately.

MODELS OF THE SAME SERIES	
KV-19TR10	KV-19TS20
KV-19TR20	
KV-19TS10	

SPECIFICATIONS

Television system	American TV standards
Channel coverage	VHF : 2-13 UHF : 14-69 Cable TV : 1-125
Picture tube	Mirror black Trinitron tube 19-inch picture measured diagonally 20-inch picture tube measured diagonally
Antenna	75-ohm external antenna terminal for VHF/UHF
Input (Only for KV-19TR20)	VIDEO INPUT (phono jacks) Video : 1Vp-p, 75-ohms unbalanced, sync negative Audio : 500mVrms (100% modulation) impedance : 10k ohms
Power requirements	120V AC, 60Hz
Power consumption	120W (Max.) 5W (in standby condition)
Accessories supplied	Remote Commander RM-781 (1) (KV-19TR20) Remote Commander RM-780 (1) (KV-19TR10) with 2 size AA (R6) batteries VHF/UHF telescopic dipole antenna (1) (Only for USA models) Antenna connector (1)
Optional accessories	U/V mixer EAC-66 Connecting cable VMC-606/607M VMC-810/820S RK-74A
Speaker Impedance	8Ω
Speaker Wattage/channel	Approx. 2W
Dimensions	Approx. 500×455×463mm(w/h/d)
Weight	Approx. 19.3kg

Designs and specifications are subject to change without notice.

MICROFILM

TRINITRON® COLOR TV

SONY®

6395

TABLE OF CONTENTS

WARNING !!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS.
THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

ATTENTION!!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÉ LORS DE TOUT DÉPANNAGE.
LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÈS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÉCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY. LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIES DANS LE PRÉSENT MANUEL. SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ.

SAFETY CHECK-OUT

(US Model only)

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).
   Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60–100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

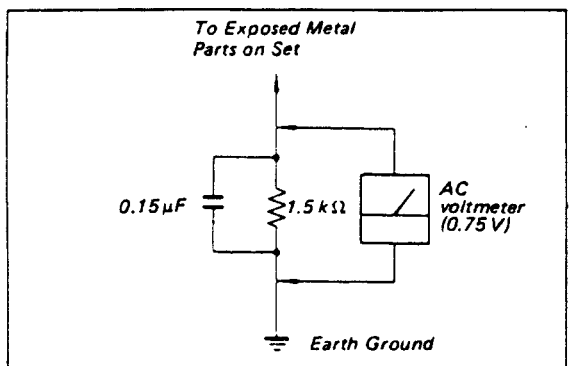


Fig. A. Using an AC voltmeter to check AC leakage.

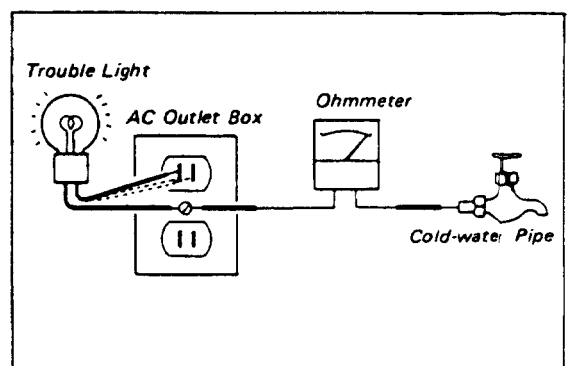
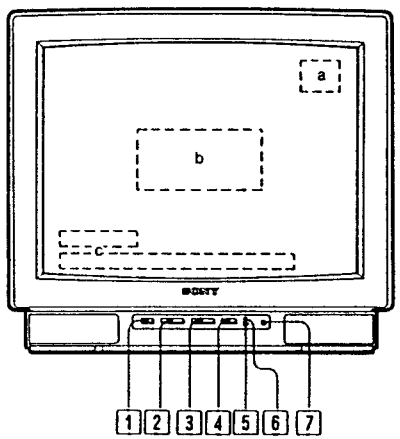


Fig. B. Checking for earth ground.

1-1. LOCATION OF CONTROLS

Front



On-screen displays
a) • Channel numbers
   • MTS mode indication
   • "MUTING", "SLEEP" or "VIDEO" indication
b) "AUTO PROGRAM", "TIMER" or "TIMER BLOCK" indication
c) • Bar display for volume or picture adjustment
   • Current time for Timer/Block

[1] **TV/VIDEO button**
(Only for KV-19TS20, KV-19TR20)

MTS button
(Only for KV-19TS10, KV-2037RS)

[2] **VOLUME +/– buttons**

[3] **CHANNEL +/– buttons**

[4] **POWER switch**

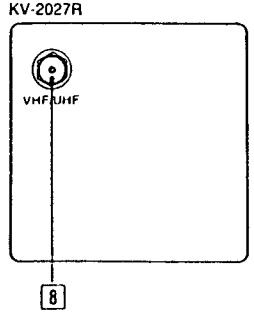
[5] **TIMER lamp**

[6] **STEREO lamp**
(Only for KV-19TS20, KV-19TS10, KV-2037RS)

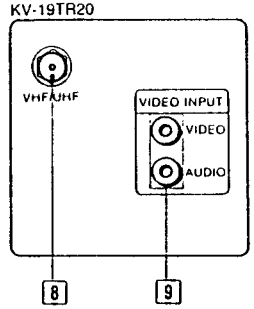
[7] **Remote control detector**

Rear

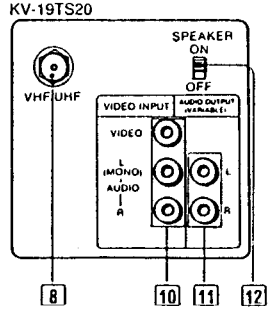
KV-19TS10
KV-19TR10
KV-2037RS
KV-2027R



KV-19TR20



KV-19TS20



[8] **VHF/UHF antenna terminal**

[9] **VIDEO INPUT jacks (VIDEO/AUDIO)**

[10] **VIDEO INPUT jacks (VIDEO/AUDIO L, R)**

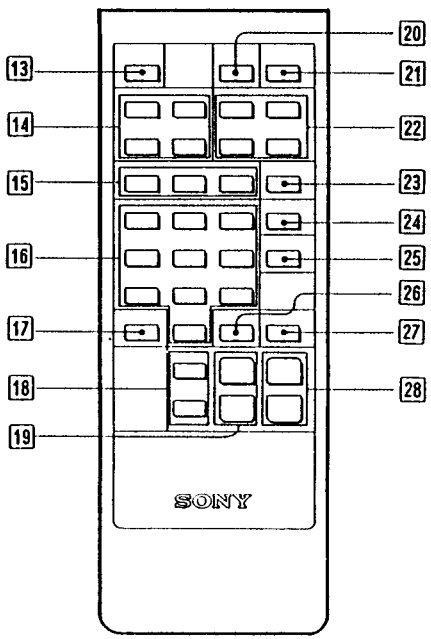
[11] **AUDIO OUTPUT (VARIABLE) jacks**

[12] **SPEAKER ON/OFF switch**

SECTION 1
GENERAL

1-2. LOCATION OF CONTENTS

Remote Commander RM-780/781/782/783



13 **MUTING button**

14 **TIMER/BLOCK setting buttons (TIMER/BLOCK, CLEAR, AM/PM, OFF/REPEAT)**

15 **Channel presetting buttons (AUTO PGM, ADD, ERASE)**

16 **Channel number buttons**

17 **DISPLAY button**

18 **PICTURE +/– buttons**

19 ***VOL (volume) +/– buttons**

20 **SLEEP button**

21 ***POWER switch**

22 **Picture adjusting buttons (SELECT, RESET, LEVEL +/–)**

23 **CABLE button**

24 ***TV/VIDEO button** (Only for RM-781, RM-783)

25 ***MTS button** (Only for RM-782, RM-783)

26 **ENTER button**

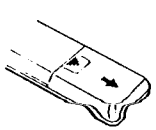
27 **JUMP button**

28 ***CH (channel) +/– buttons**

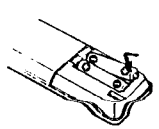
* The functions of these buttons are also available on the TV.

Battery installation

1 Open the lid.



2 Insert two size AA(R6) batteries with correct polarity.

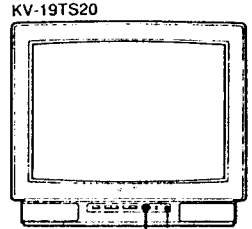


- In normal operation, batteries will last up to half a year. If the Commander does not operate properly, the batteries might be exhausted. Replace them with new ones.
- To avoid damage from possible battery leakage, remove the batteries when the Commander will not be used for a long time.
- If a Remote Commander that is not recommended is used to operate this TV, or if the supplied Remote Commander is used to operate another TV, the TV may not operate properly.

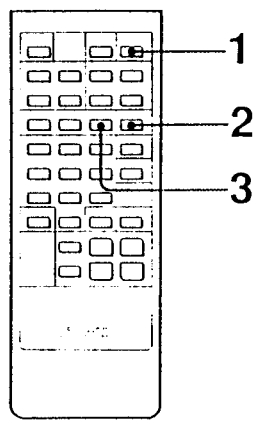
1-3. PRESETTING TV CHANNELS

To Preset All Receivable Channels Automatically

KV-19TS20

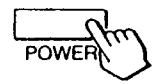


1 Remote control detector

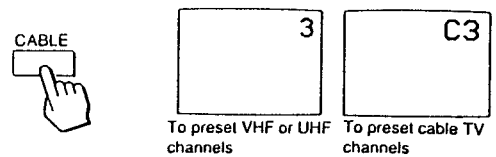


RM-783

1 **Press POWER on the TV or the Remote Commander to turn the TV on.**



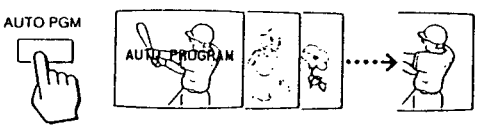
2 **Press CABLE so that the appropriate mode appears.**



To preset VHF or UHF channels

To preset cable TV channels

3 **Press AUTO PGM.**



"AUTO PROGRAM" is displayed on the screen and receivable channels (other than the channels already preset) will be preset in numerical sequence. The channels previously preset remain in the unit's memory.
When no more channels can be found, the programming stops and the lowest numbered channel is displayed.

Receivable channles of this TV are:
VHF: 2-13
UHF: 14-69
Cable: 1-125

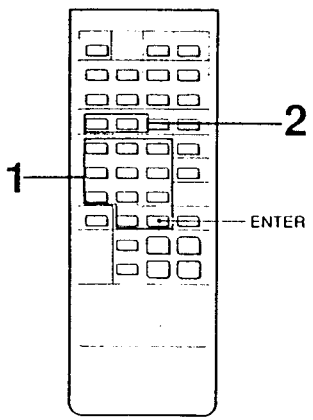
To add the channels that could not be preset with automatic programming because their signal strength was too weak, or to erase unnecessary channels, follow the steps in "To preset only the desired channels" on the next page.

To check preset channels
Press CH +/–.

Only for KV-19TS20, KV-19TR20
If the "VIDEO" indication is displayed on the screen
Press the TV/VIDEO button on the TV or on the Remote Commander so that a channel number appears.

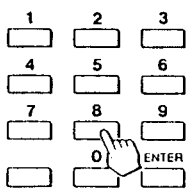
1-4. WATCHING TV PROGRAMS

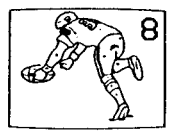
To Preset Only the Desired Channel or to Erase Unnecessary Channels



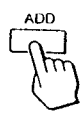
RM-783

1 **Press the channel number button(s) and then ENTER to select the channel to be added or erased.**



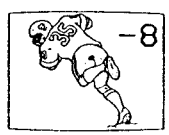


2 **To add channels – Press ADD.**



A "+" appears for a moment.
This channel has now been added to the channel scan memory.

To erase channels – Press ERASE.



A "–" appears for a moment.
This channel has now been erased from the channel scan memory.
The next time the CH +/– button is pressed, this channel will be skipped.

Repeat steps 1 and 2 for other channels to be added or erased.

When a VHF or UHF channel is erased
The cable TV channel with the same number is also erased and vice versa.

Cable TV channel chart*
Cable TV systems use letters or numbers to designate channels. To tune in a channel, refer to the chart below.

Number on this TV	1	.5	6	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Corresponding CATV channel	A-8	A-7	A-6	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q

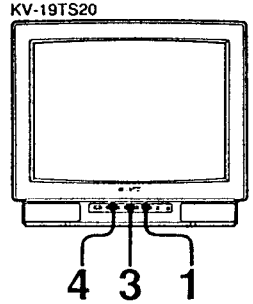
31	32	33	34	35	36	37	38	39	.....	93	94	95	96	97	98	99	100	101	102	.....	123	124	125
R	S	T	U	V	W	W+1	W+2	W+3	.....	W-57	W-58	A-5	A-4	A-3	A-2	A-1	W-59	W-60	W-61	.....	W-82	W-83	W-84

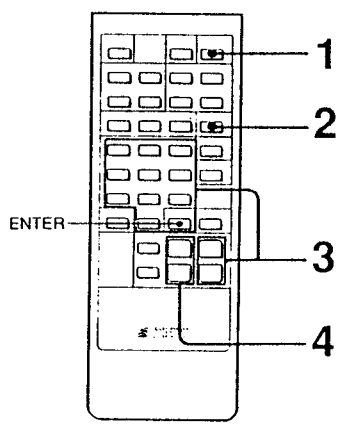
Check with your local cable TV company for more complete information on the available channels.

* The designation of the cable TV channels conforms to the EIA-NCTA recommendation.

Pay cable TV systems use scrambled or encoded signals and require special converters (decoders) in addition to the normal cable connection

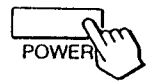
KV-19TS20



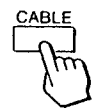


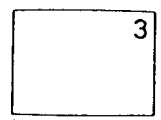
RM-783

1 **Press POWER on the TV or the Remote Commander to turn the TV on.**

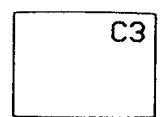


2 **Press CABLE so that the appropriate mode appears.**





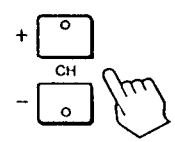
To view VHF or UHF channels



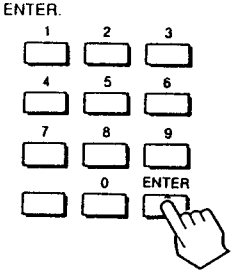
To view cable TV channels

3 **Select a channel in one of the following two ways:**

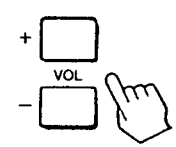
To scan the preset channels in numerical sequence, press CH +/–.



To select a channel directly, press the channel number button(s) and then ENTER. For example, to select channel 10, press 1, 0 and ENTER.

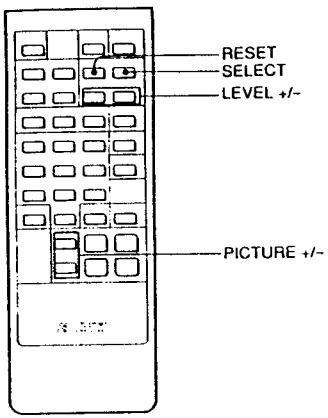


4 **Press VOL + or – to adjust the volume.**



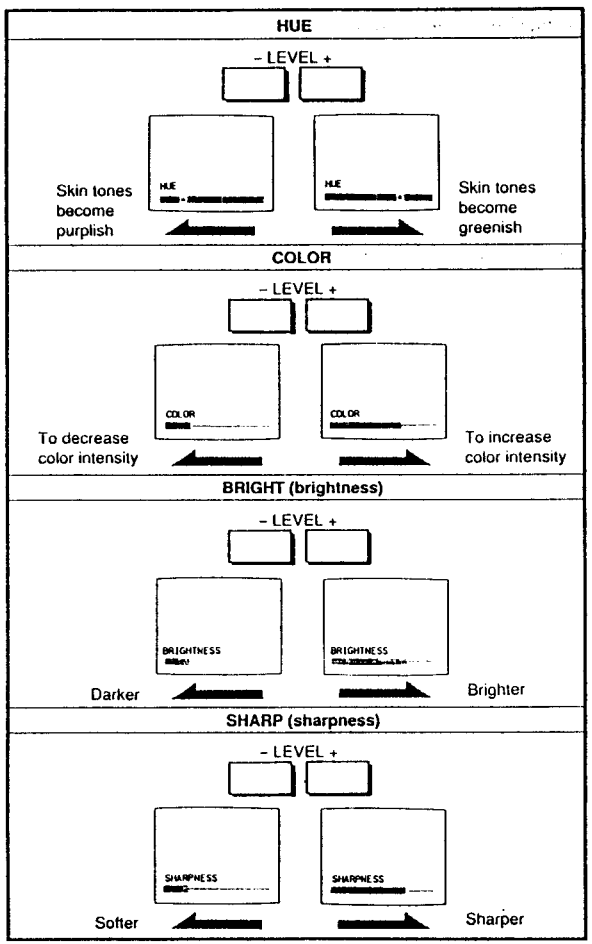
Note
To turn off the TV
Press POWER on the TV or the Remote Commander again.

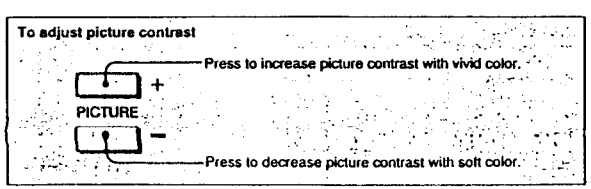
1-5. ADJUSTING THE PICTURE



RM-783

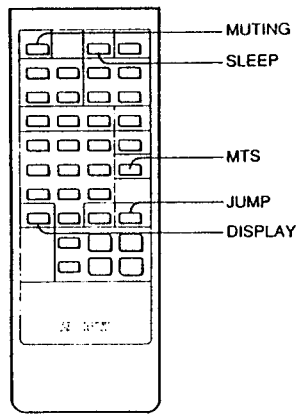
Press SELECT repeatedly until the on-screen display of the item to be adjusted appears, then press LEVEL +/-.





To clear the adjustment levels and restore the factory preset levels at once, press **RESET**.

1-6. ENJOYING THE CONVINIENT FEATURES



RM-783

Muting the sound

Press MUTING.
The "MUTING" indication will appear on the screen.
To restore the sound, press MUTING again or VOL +.

Using the SLEEP timer

Press SLEEP.
The TV will be turned off automatically after about one hour.
The green "SLEEP ON" indication will appear on the screen for a few seconds when SLEEP is pressed and the red "SLEEP" indication will appear one minute before the TV is turned off.
To cancel the SLEEP timer, press SLEEP again, or turn off the TV. The "SLEEP OFF" indication will appear when SLEEP is pressed again.

Receiving a Multichannel TV Sound program (Only for KV-19TS20, KV-19TS10, KV-2037RS)

Each time **MTS** is pressed, MAIN, SAP (Second Audio Program), or MONO are selected in sequence.
To listen to stereo sound, select the MAIN mode so that the on-screen MAIN indication appears. The STEREO indicator on the TV lights up whenever a stereo broadcast is received.
There may be cases of stereo broadcasts where excessive noise will be heard due to a weak incoming signal. You may be able to eliminate this noise by selecting the MONO mode.

Switching quickly between two channels

Press JUMP.
Each time JUMP is pressed, the channel which appeared on the screen directly before is recalled. This button enables you to keep track of two programs alternately.

Keeping the channel displayed

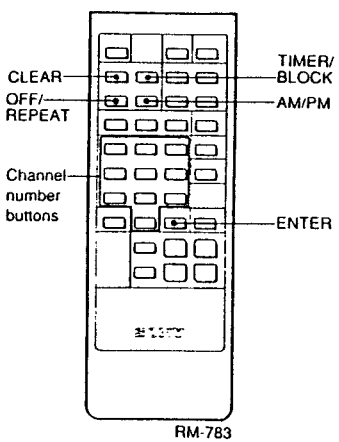
Press DISPLAY.
To make the channel display disappear, press DISPLAY again.

1-7. TIMER/BLOCK

Available Functions

Internal clock	Once the internal clock is set, the current time will appear on the screen. It is necessary to set the clock correctly to activate the program start TIMER and channel BLOCK.
Program start TIMER	Makes a program of your choice appear on the screen automatically at the desired time.
Channel BLOCK	Blocks a channel from appearing on the screen for 12 hours. Use channel BLOCK to prevent children from watching undesirable programs.

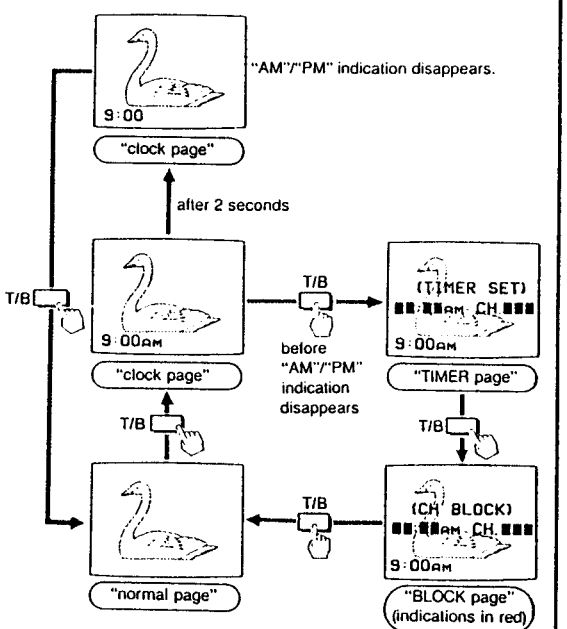
The buttons used for the above functions are located on the Remote Commander.



To set the internal clock, program start TIMER and channel BLOCK, you must summon the corresponding "pages": "clock page," "TIMER page" and "BLOCK page."

To change the "pages", press TIMER/BLOCK.

T/B stands for the TIMER/BLOCK button.

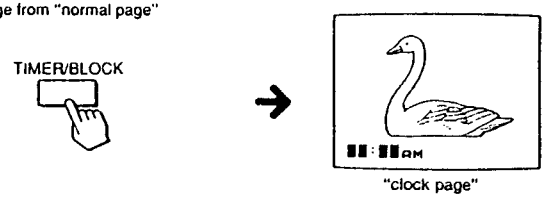


- All settings will be erased from the unit's memory if the unit is unplugged, or if a power failure occurs.
- The TIMER and BLOCK will operate only if the clock is set correctly.
- If the TIMER and BLOCK are set for overlapping times on the same channel, the blocked channel will appear on the screen at the time set on the TIMER.

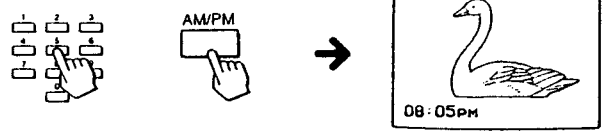
How to Set the Internal Clock

Example: To set the clock to 8:05 PM

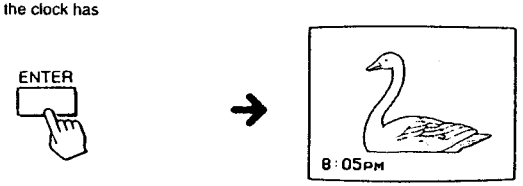
1 Press TIMER/BLOCK once to change from "normal page" to "clock page."



2 Press 0, 8, 0, 5 AM/PM (0 necessary).



3 If you have performed the operation correctly, press ENTER.
The numbers will "wink" to indicate that the clock has been set. (The 0 in front will disappear.)



If you have made a mistake, press CLEAR and return to step 2. The "AM/PM" indication will disappear after 2 seconds.

To summon "TIMER page," press TIMER/BLOCK before the "AM"/"PM" indication disappears.

To return to "normal page," press TIMER/BLOCK after the "AM"/"PM" indication has disappeared.

To reset the clock, summon "clock page" and press CLEAR before the "AM"/"PM" indication disappears. Then follow the steps above from step 2.

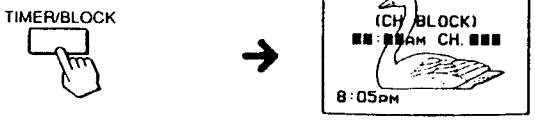
12:00 AM stands for midnight.
12:00 PM stands for noon.

How to Set the Channel BLOCK

Make sure that the clock has been set correctly before setting the channel BLOCK.

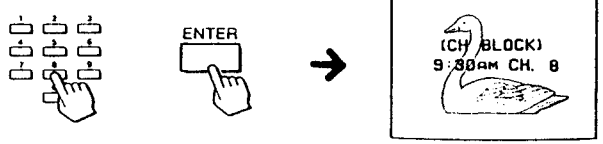
Example: To set the BLOCK for a program which begins at 9:30 AM on channel 8

1 Press TIMER/BLOCK three times to change from "normal page" to "BLOCK page."



"BLOCK page"
(indications in red)

2 Press 0, 9, 3, 0, ENTER (0 necessary).
Numbers will "wink" to indicate that the time has been set.
Press 8, ENTER (0 not necessary).
Numbers will "wink" to indicate that the channel has been set.



The BLOCK has now been set.

If you have made a mistake, press CLEAR and return to step 2.

At the preset time, the picture of the selected channel will be blocked from view and the sound will be muted.
A red "BLOCKED" indication will appear on the screen while the channel is blocked.
Normal reception will be resumed after 12 hours.

To return to normal reception while the channel is blocked, recall "BLOCK page" and press CLEAR.

The BLOCK setting blocks a specified channel for the same 12-hour period everyday.

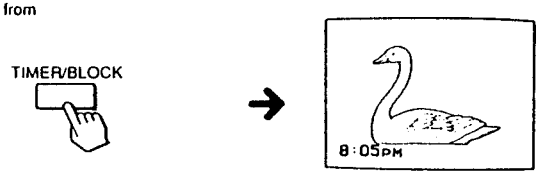
To clear BLOCK setting, summon "BLOCK page" and press CLEAR.
To reset, clear the setting and follow the steps above from step 2.

How to Set the Program Start TIMER

Make sure that the clock has been set correctly before setting the program start TIMER.

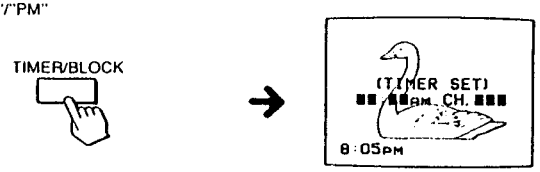
Example: To set the TIMER for a program which begins at 10:30 PM on channel 12

1 Press TIMER/BLOCK once to change from "normal page" to "clock page."



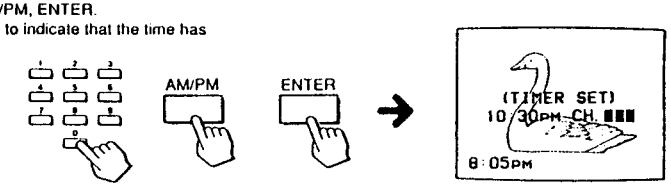
"clock page"

2 Press TIMER/BLOCK before the "AM"/"PM" indication disappears and summon "TIMER page."

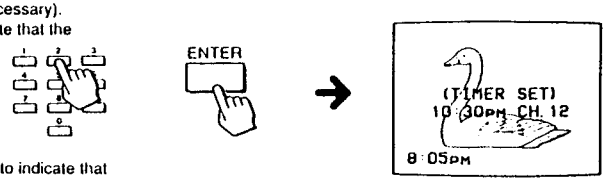


"TIMER page"

3 Press 1, 0, 3, 0, AM/PM, ENTER.
Numbers will "wink" to indicate that the time has been set.



4 Press 1, 2, ENTER (0 not necessary).
Numbers will "wink" to indicate that the channel has been set.



The TIMER lamp will light up to indicate that the TIMER has been set.

If you have made a mistake, press CLEAR and return to step 3.

At the preset time, the selected channel will appear on the screen and the TIMER lamp will go out. The TIMER will operate whether you are watching a TV program or a VCR playback, or even if you have turned off the TV.

If no button is pressed within 2 hours after the preset time, an "OFF" indication will appear on the screen for 1 minute. If a button is still not touched during the 1 minute, the TV will turn off automatically as a safety precaution.

The TIMER operates only once, but the time and the channel will remain in the unit's memory.

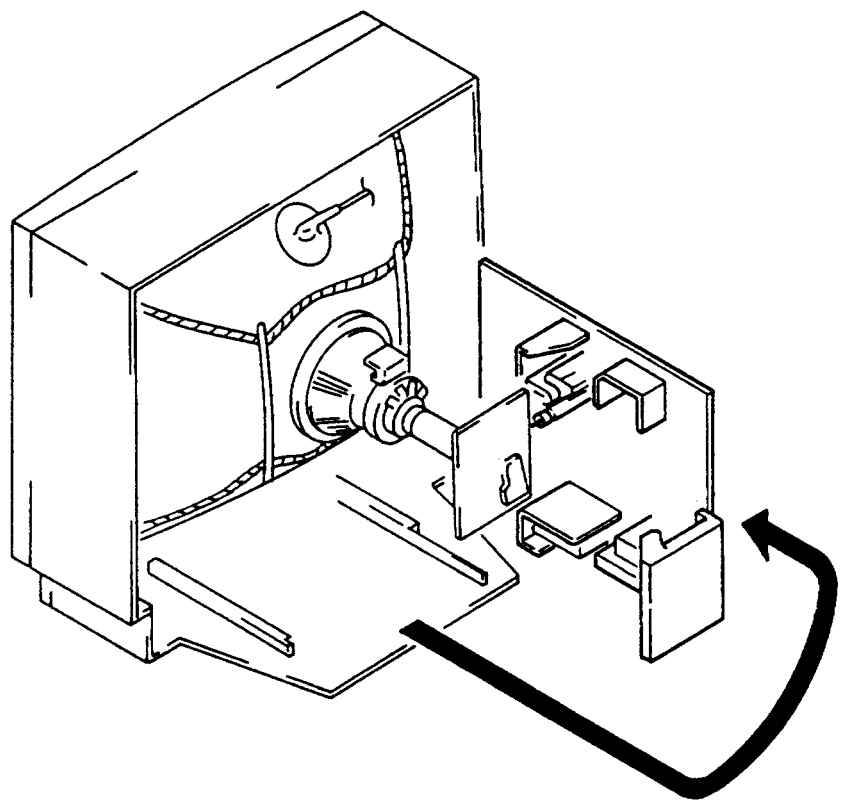
If you want to preset the same channel at the same time for a future date, press OFF/REPEAT. The TIMER lamp will light up to indicate that the TIMER has been reactivated.

If you want to deactivate the TIMER, press OFF/REPEAT again so that the TIMER lamp goes out. It is not necessary to summon "TIMER page" to use the OFF/REPEAT button. Furthermore, this button is effective even if the TV has been turned off.

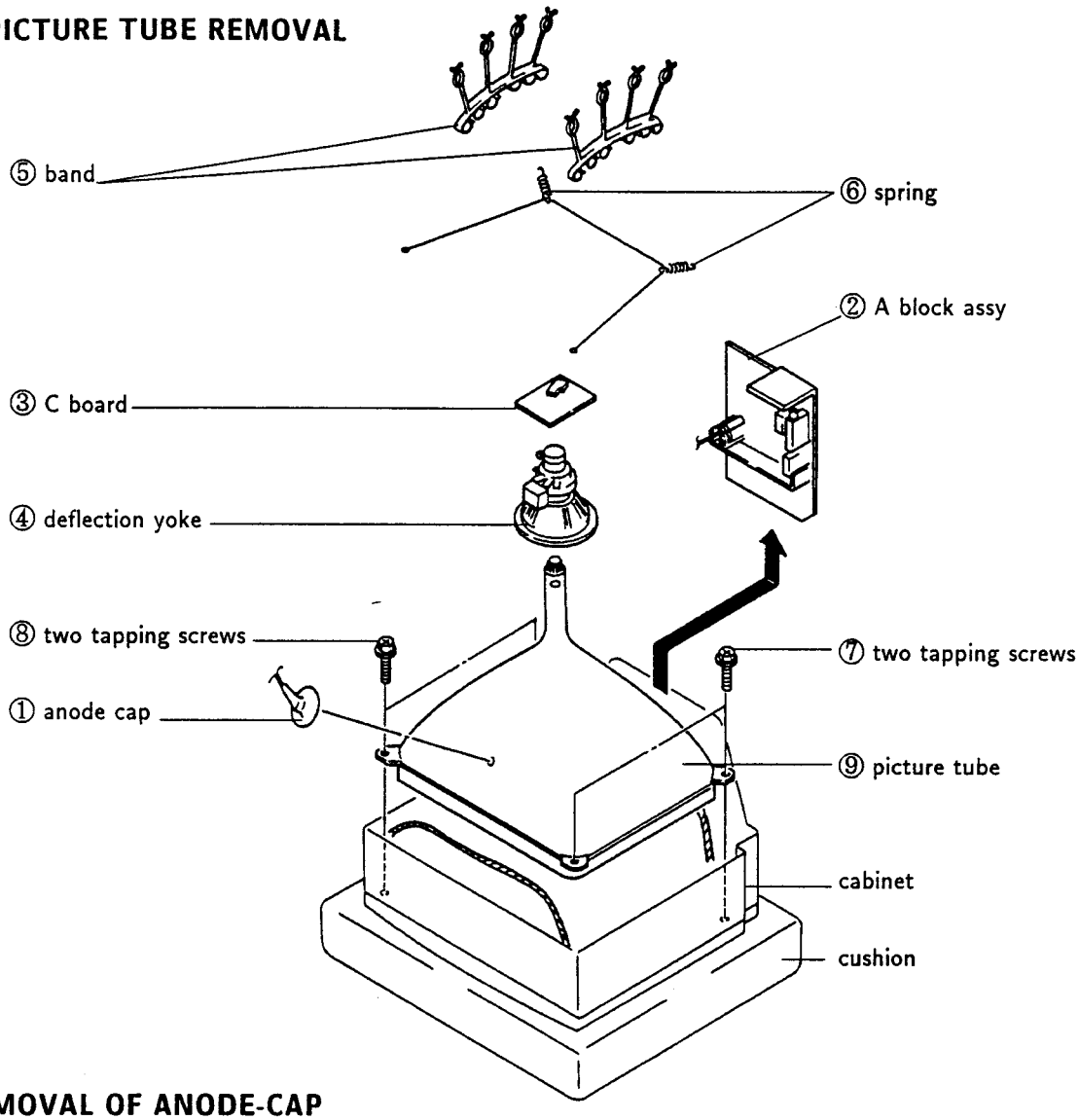
To clear the TIMER setting, summon "TIMER page" and press CLEAR.
To reset, clear the setting and follow the steps from step 3.

SECTION 2
DISASSEMBLY

2-1. SERVICE POSITION

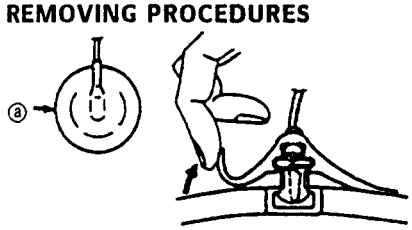


2-2. PICTURE TUBE REMOVAL

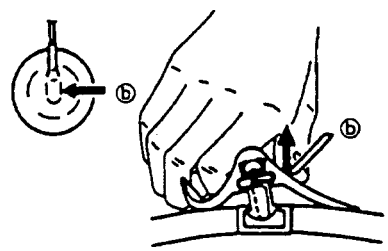


• REMOVAL OF ANODE-CAP

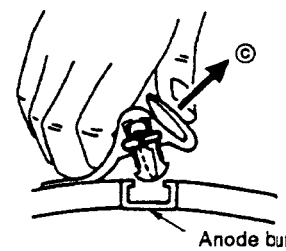
• REMOVING PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ.



② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ.



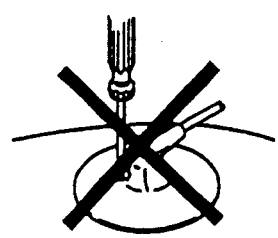
③ When one side of the rubber cap is separated from the anode button, the snode-cap can be removed by turning up the rubber cap and pulling up it in the direction of the arrow ⓒ.

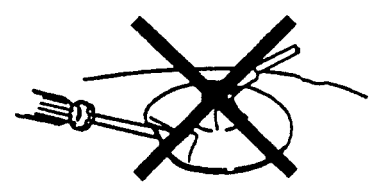
• HOW TO HANDLE AN ANODE-CAP

① Don't hurt the surface of anode-caps with sharp shaped material!

② Don't press the rubber hardly not to hurt inside of anode-caps!
A material fitting called as shatter-hook terminal is built in the rubber.

③ Don't turn the foot of rubber over hardly!
The shatter-hook terminal will stick out or hurt the rubber.





SECITON 3
SET-UP ADJUSTMENTS

- The following abjustments should be made when a complete realignment is required or a new picture tube is installed.
- These abjustments should be performed with rated power supply voltage unless otherwise noted.

Controls and switch should be set as follows unless otherwise noted :

PICTURE control ..... MAXIMUM
BRIGHTNESS control ..... MAXIMUM

Perform the adjustments in order as follows :

1. Beam Landing
2. Convergence
3. Focus
4. Sub Brightness
5. White Balance

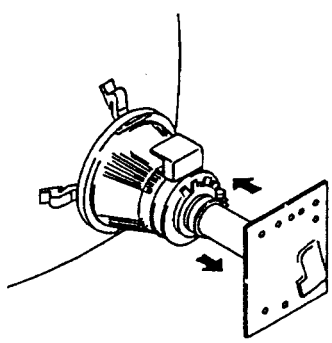
Note : Test Equipment Repuired.
1. Color-bar/Pattern Generator
2. Degausser

3-1. BEAM LANDING

Preparation.

- Feed in the white pattern.
- Before starting, degauss the entire screen.

1. Loosen deflection yoke screw.
2. Adjust purity control as shown in Fig.3-1.
3. Slide deflection yoke as far forward as it will go.
4. Turn the raster signal of the pattern generator to red.
5. Adjust purity control to center vertical red band as shown in Fig.3-2.
6. Slide deflection yoke back for a uniform red screen.
7. Check green and blue rasters for uniformity by performing the same way as steps 4, 5 and 6.
8. Tighten the deflection yoke screw.
9. Check if mislanding appears at corners a—d as shown in Fig. 3-3. If mislandig is observed, correct it as shown in Fig. 3-3.
10. Confirm that beam landing is correct when the receiver is faced in all directions.



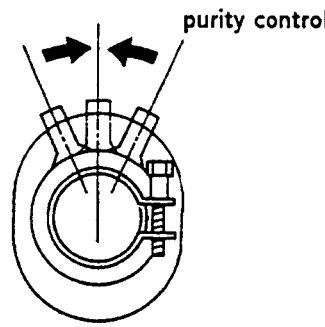


Fig. 3-1.

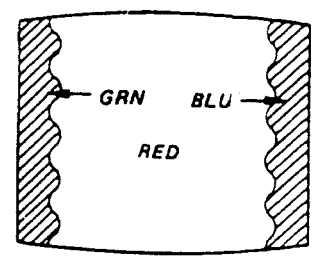


Fig. 3-2.

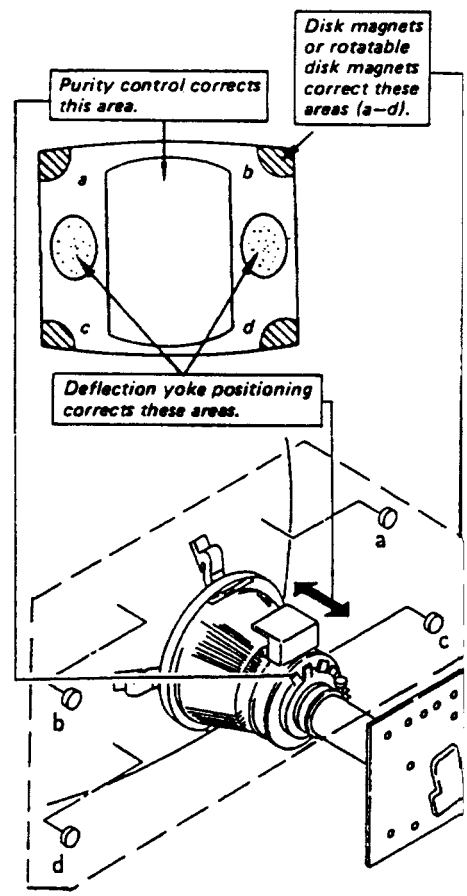


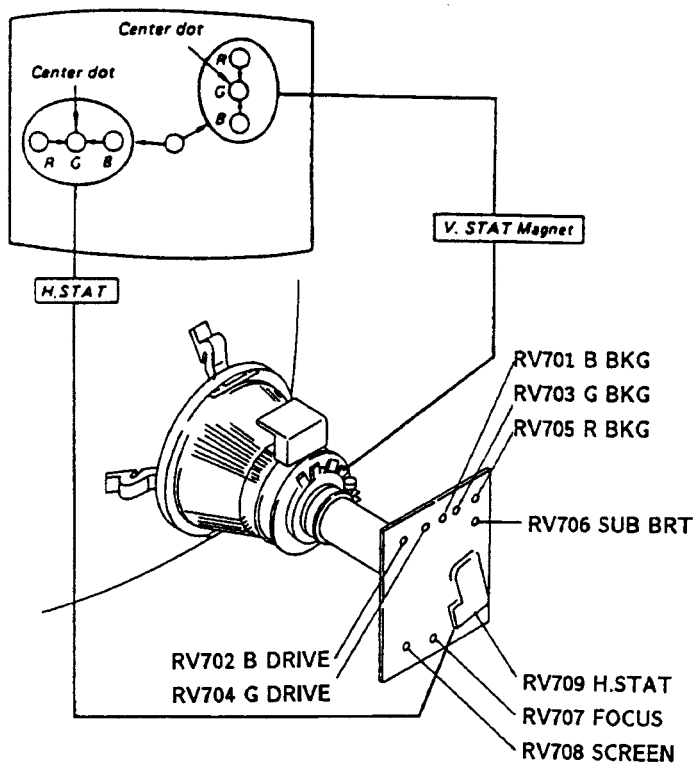
Fig. 3-3.

3-2. CONVERGENCE

Preparation :

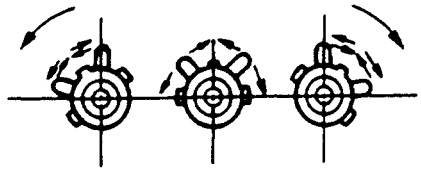
- Before starting, perform FOCUS, H. SIZE and V. SIZE adjustments.
- Set BRIGHTNESS control to fully counterclock - wise.
- Feed in the dot pattern.

(1) Horizontal and Vertical Static Convergence

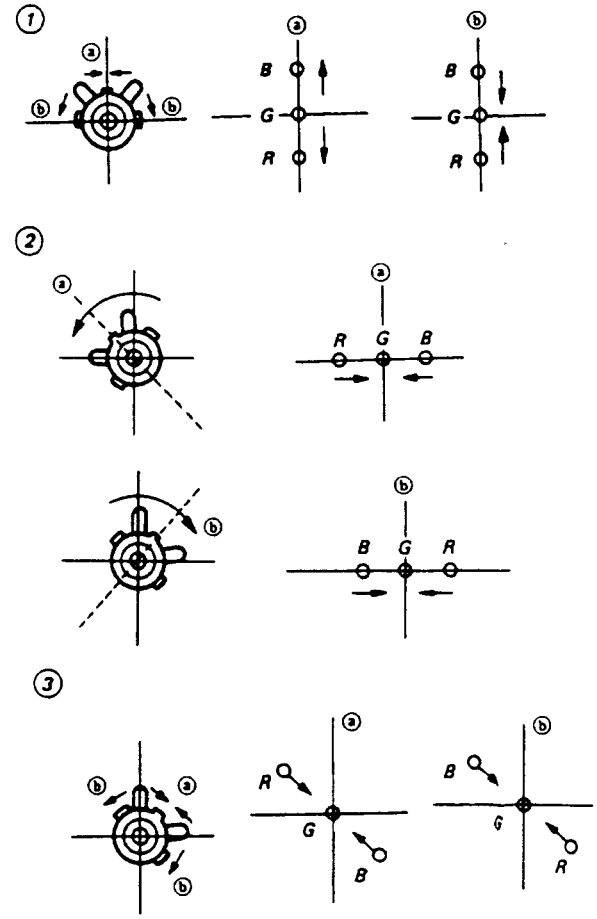


1. Adjust H. STAT VR to coincide red, green and blue dots on the center of screen. (Horizontal movement)
2. Adjust V. STAT magnet to coincide red, green and blue dots on the center of screen. (Vertical movement)
3. If the red, green and blue dots do not coincide on the center of screen with H. STAT VR, perform horizontal convergence adjustment using H. STAT VR and V. STAT magnet as shown below. (In this case, H. STAT VR and V. STAT magnet effect each other.)

- Tilt the V.STAT magnet and adjust static convergence to open or close the V. STAT magnet.



4. When the V.STAT magnet is moved in the direction of arrow ⓐ and ⓑ , Red, Green and Blue dots move as shown below.

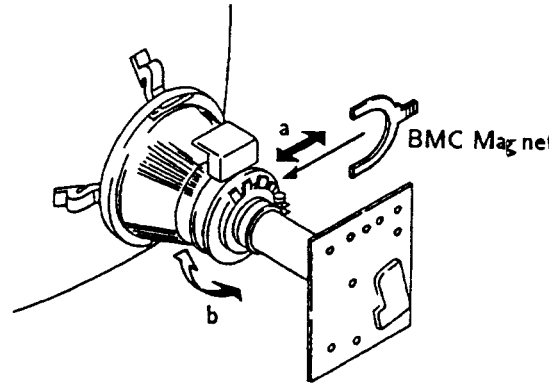


If blue dot dose not coincide with red and green dots, perform following steps.

Move BMC magnet (a) to correct insufficient H. static convergence.

Rotate BMC magnet (b) to correct insufficient V. static convergence.

In either case, repeat Beam Landing Adjustment.

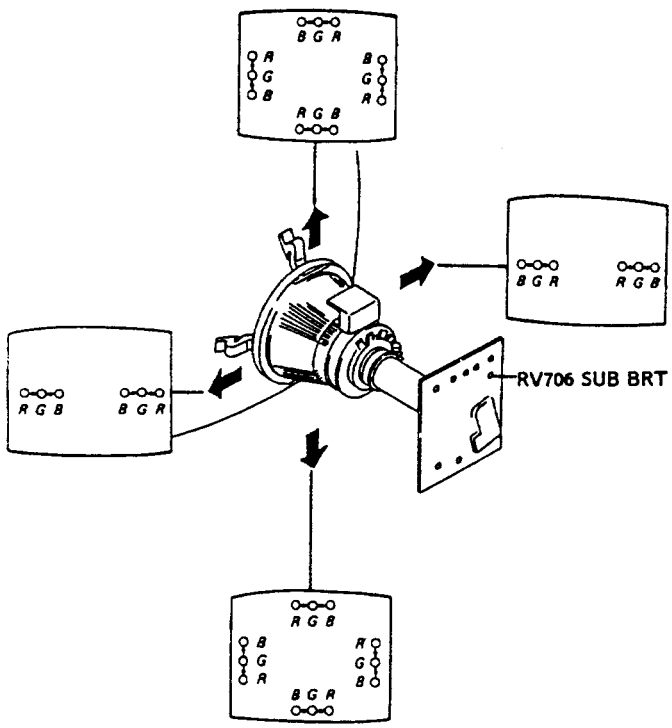


(2) Dynamic Convergence Adjustment

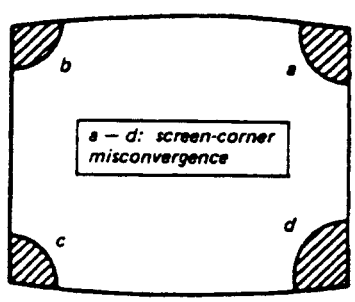
Preparation :

- Before starting, perform Horizontal and Vertical Static Convergence Adjustment.

1. Loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below.
4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.



(3) Screen-corner Convergence



3-3. FOCUS (G4)

Adjust FOCUS control for a best picture.

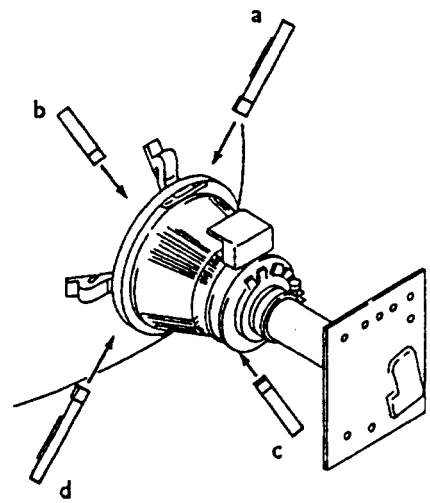
3-4. SUB BRT (RV706)

1. Feed in a cross-hatch pattern.
2. Set PICTURE and BRIGHTNESS to minimum.
3. Turn RV706 (SUB BRT) slowly to obtain a faintly visible cross-hatch.

3-5. WHITE BALANCE

Feed in the cross-hatch pattern.

1. Set BRIGHTNESS and PICTURE controls to minimum.
2. Turn RV702 (B.DRIVE) and RV704 (G. DRIVE) fully counterclockwise.
3. Set RV705 (R.BKG), RV703 (G.BKG), RV 701 (B.BKG) and RV706 (SUB BRT) to mechanical center.
4. Turn RV708(SCREEN) slowly to obtain a faintly visible cross-hatch. Note the color that first becomes visible by turning RV708. Do not turn a BKG control for this color.
5. Adjust the other two BKG controls for best white balance (neutral gray) of the faint cross-hatch.
6. Set BRIGHTNESS and PICTURE controls to maximum. Observe the screen and adjust the DRIVE controls for best white balance.
7. Repeat Steps 1 through 6 several times.



Permalloy

SECTION 4
SAFETY RELATED ADJUSTMENTS

⧓ R324 CONFIRMATION METHOD (HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with ◪ on the schematic diagram).
IC601, IC301, PM501, D501, D321, C565, C563, R565, R512, R325, R324, T504, DY

1. Preparation before confirmation
   1) Turn the POWER switch ON, and receive entirely white signals and set the PICTURE and BRIGHT controls to maximum.
   2) Confirm that voltage of the check terminal of pin ④ of A-14 (A BOARD) is more than 126.0V DC when the set is operating normally with 120.0± 2.0V AC supply.

2. Hold-down operation confirmation
   1) Turn the POWER switch ON, and receive entirely white signals and adjust ABL current to 1300 ±20 μA with PICTURE and BRIGHT etc controls.
   2) Apply DC voltage to the check terminal of pin ④ of A-14 (A BOARD) via 1T40 from the DC stabilized power source.
      Confirm that the minimum voltage is less than 144.0V DC whereby the raster disappears during operation of hold-down circuit.
      NOTE: When the hold-down circuit starts operating, switch OFF the POWER of the set immediately.
   3) Turn the POWER switch ON, and receive dot signals and adjust ABL current to 30±20μA with PICTURE and BRIGHT etc controls.
   4) Apply DC voltage to the check terminal of pin ④ of A-14 (A BOARD) via 1T40 from the DC stabilized power source.
      Confirm that the minimum voltage is less than 144.0V DC whereby the raster disappears during operation of hold-down circuit.
      NOTE: When the hold-down circuit starts operating, switch OFF the POWER of the set immediately.

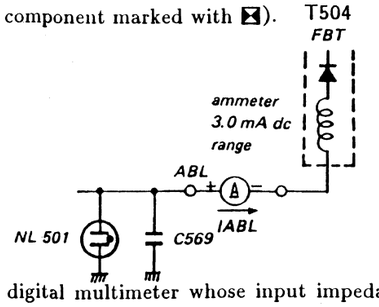
3. Hold-down readjustment
   When step 2 is not satisfied, readjustment should be performed by altering the resistance value of R324 (a component marked with ⧓).

⧓ R322 CONFIRMATION METHOD (HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components (marked with ◪ on the schematic diagram).
IC301, PM501, D501, R565, R512, R322

1. Preparation before confirmation
   1) Supply 120±2.0V AC to with variable autotransformer.
2. Hold-down operation confirmation
   1) Turn the POWER switch ON, and receive entirely white signals and adjust ABL current to 1300 ±20 μA with PICTURE and BRIGHT etc controls.
   2) Apply DC voltage to the check terminal of pin ② of PM501 (A BOARD) via 1T40 from the DC stabilized power source. Confirm that the minimum voltage is less than 154.0V DC whereby the raster disappears during operation of hold-down circuit.
      NOTE: When the hold-down circuit starts operating, switch OFF the POWER of the set immediately.
   3) Turn the POWER switch ON, and receive dot signals and adjust ABL current to 30±20μA with PICTURE and BRIGHT etc controls.
   4) Apply DC voltage to the check terminal of pin ② of PM501 (A BOARD) via 1T40 from the DC stabilized power source. Confirm that the minimum voltage is less than 158.0V DC whereby the raster disappears during operation of hold-down circuit.
      NOTE: When the hold-down circuit starts operating, switch OFF the POWER of the set immediately.

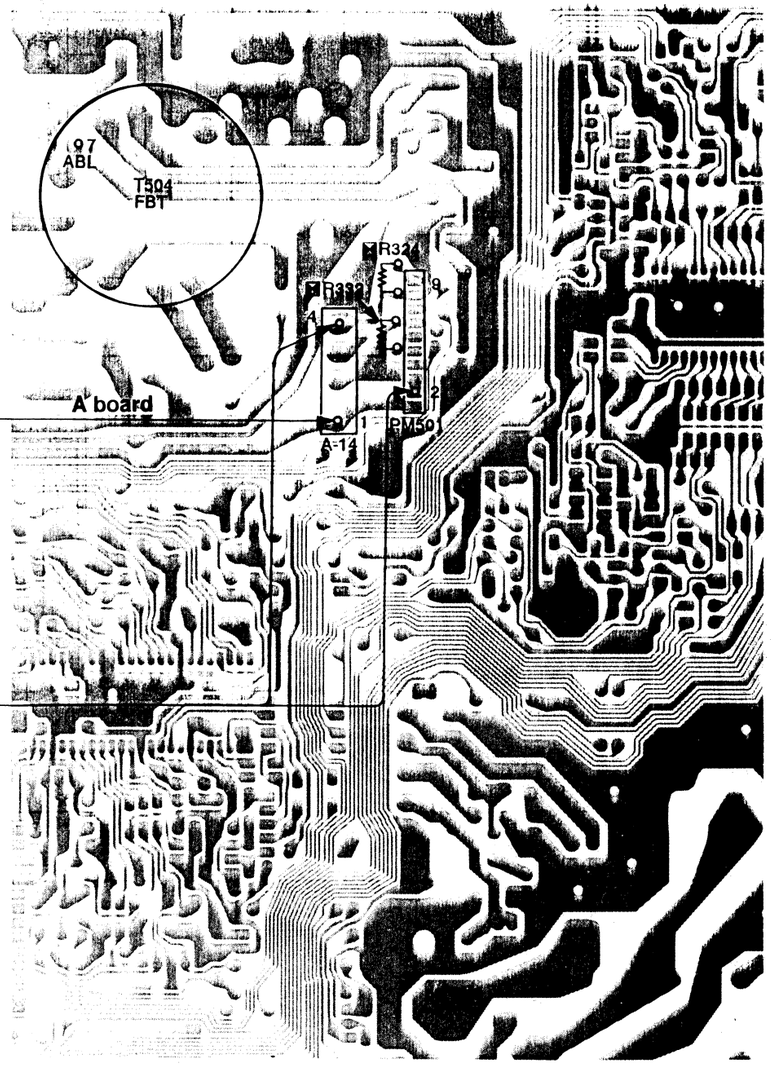
3. Hold-down readjustment
   When step 2 is not satisfied, readjustment should be performed by altering the resistance value of R322 (a component marked with ⧓).



*Use a digital multimeter whose input impedance is over 100MΩ when confirming the voltage of the protector terminal.

+B VOLTAGE CONFIRMATION

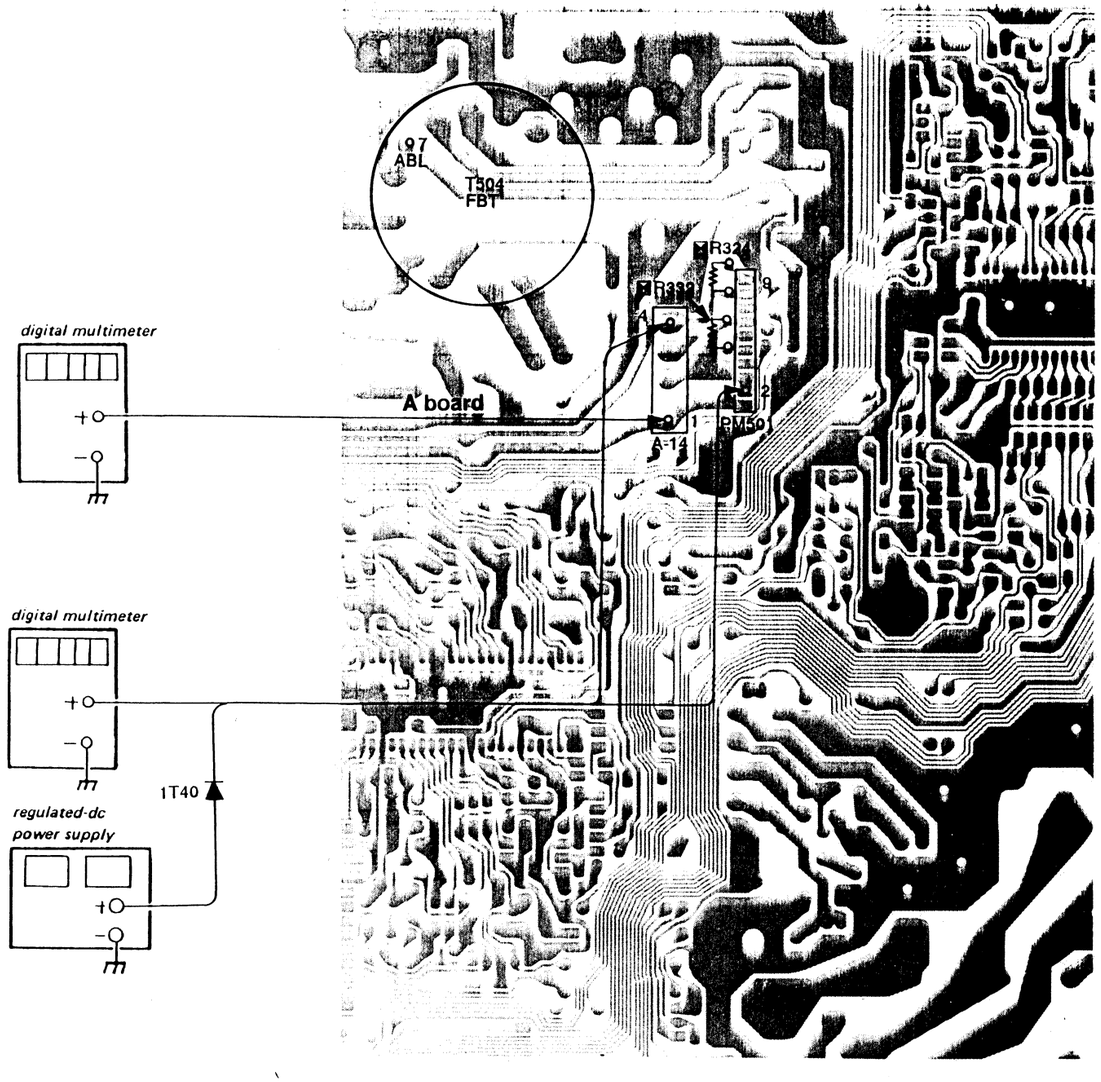
The following adjustments should always be performed when replacing IC601.
1) Supply 130$^{+2.0}_{0}$V AC to with variable auto-transformer.
2) Receive entirely monoscope signal.
3) Set the PICTURE control and the BRIGHT controls in to initial reset.
4) Confirm the voltage of pin ① of A-14 (A BOARD) is less than 138.0V DC.
5) If step 4) is not satisfied, replace IC601 repeat above steps.



+B VOLTAGE CONFIRMATION

The following adjustments should always be performed when replacing IC601.

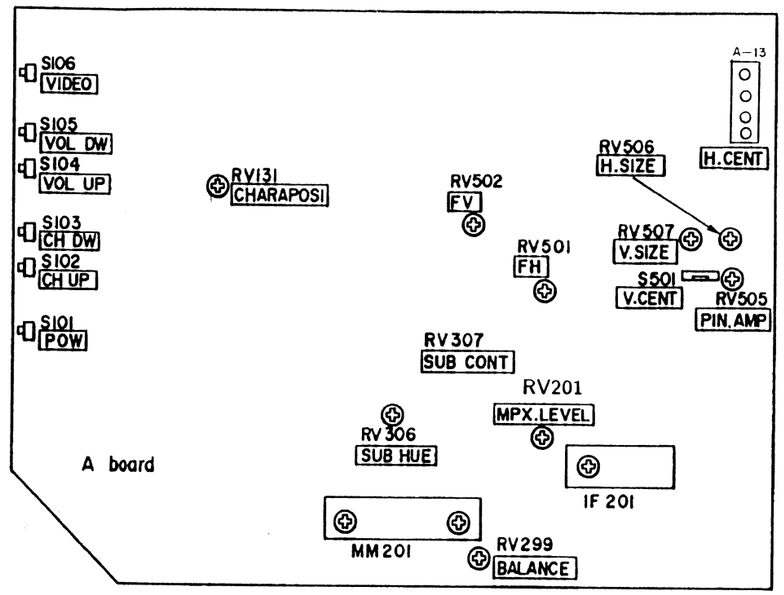
1) Supply $130^{+2.0}_{-0}$V AC to with variable auto-transformer.
2) Receive entirely monoscope signal.
3) Set the PICTURE control and the BRIGHT controls in to initial reset.
4) Confirm the voltage of pin ① of A-14 (A BOARD) is less than 138.0V DC.
5) If step 4) is not satisfied, replace IC601 repeat above steps.



SECTION 5
CIRCUIT ADJUSTMENTS

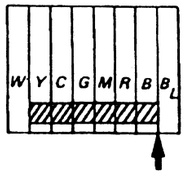
5-1. A BOARD ADJUSTMENTS

A BOARD (COMPONENT SIDE)



BAR POSITION ADJUSTMENT (RV131)

1. Receive a color-bar signal.
2. Set the PICTURE button to maximum.
3. Adjust RV131 to the point where the arrow indicate.

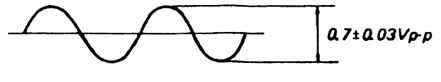


RF AGC ADJUSTMENT (IF201)

1. Recive an off-air signal.
2. Adjust AGC VR (AGC VR of IF201) so that snow noise and cross-modulation just disappear from the picture.

MPX LEVEL ADJUSTMENT (RV201)

1. Receive 400Hz (100% modulation) sound signal.
2. Connect an oscilloscope to TP21(MPX OUT).
3. Adjust RV201 so that the MPX level is 0.7±0.03 Vp-p.

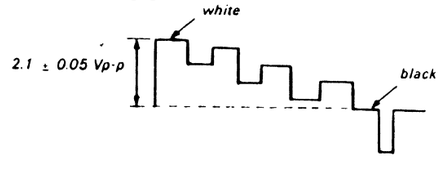


AUDIO BALANCE ADJUSTMENT (RV299)

1. Recieve monoral signal.
2. Connect the dual-trace-oscilloscope at SP out Lch (K-2 connector and Rch (K-3 connector).
3. Adjust RV299 so that Lch and Rch are same level.

SUB CONTRAST ADJUSTMENT (RV307)

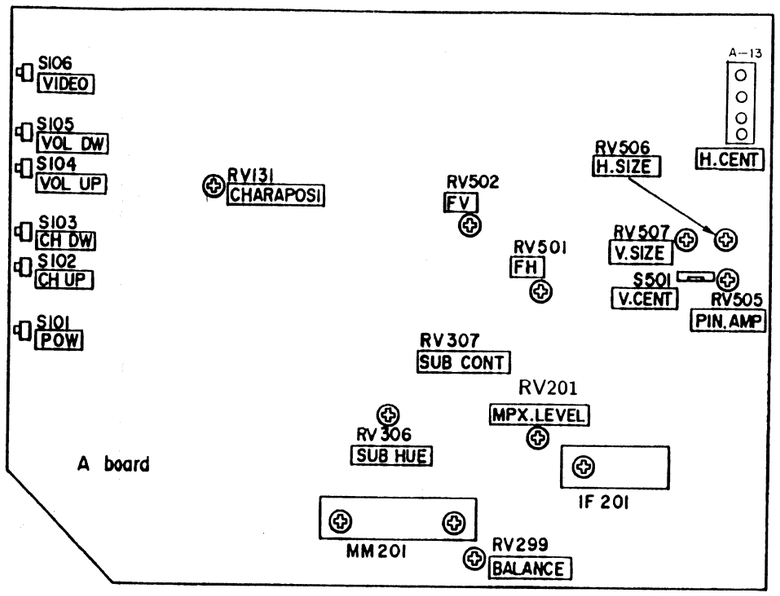
1. Receive a color-bar signal.
   PICTURE ..... MAX
   BRT ..... CENTER
   COLOR ..... MIN
2. Connect circuit between Base of Q354 and 9.3V line with a jumper wire.
3. Draw A-8 — C-3 connector (C Board).
4. Connect an oscilloscope to the pin ④ of A-8 connector (blue out).
5. Adjust RV307 (SUB CONT) so that voltage is 2.1±0.05Vp-p.



SECTION 5
CIRCUIT ADJUSTMENTS

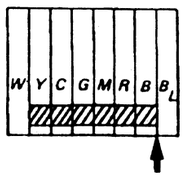
5-1. A BOARD ADJUSTMENTS

A BOARD (COMPONENT SIDE)



BAR POSITION ADJUSTMENT (RV131)

1. Receive a color-bar signal.
2. Set the PICTURE button to maximum.
3. Adjust RV131 to the point where the arrow indicate.

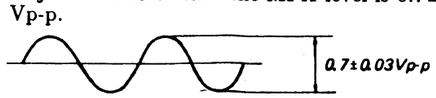


RF AGC ADJUSTMENT (IF201)

1. Recive an off-air signal.
2. Adjust AGC VR (AGC VR of IF201) so that snow noise and cross-modulation just disappear from the picture.

MPX LEVEL ADJUSTMENT (RV201)

1. Receive 400Hz (100% modulation) sound signal.
2. Connect an oscilloscope to TP21(MPX OUT).
3. Adjust RV201 so that the MPX level is 0.7±0.03 Vp-p.

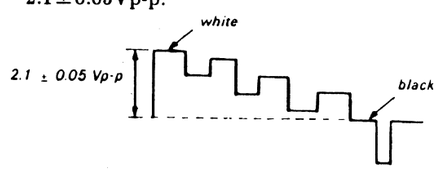


AUDIO BALANCE ADJUSTMENT (RV299)

1. Recieve monoral signal.
2. Connect the dual-trace-oscilloscope at SP out Lch (K-2 connector and Rch (K-3 connector).
3. Adjust RV299 so that Lch and Rch are same level.

SUB CONTRAST ADJUSTMENT (RV307)

1. Receive a color-bar signal.
   PICTURE ..... MAX
   BRT ..... CENTER
   COLOR ..... MIN
2. Connect circuit between Base of Q354 and 9.3V line with a jumper wire.
3. Draw A-8 — C-3 connector (C Board).
4. Connect an oscilloscope to the pin ④ of A-8 connector (blue out).
5. Adjust RV307 (SUB CONT) so that voltage is 2.1±0.05Vp-p.

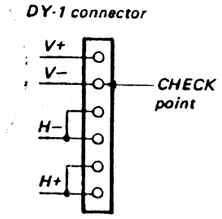


H.FREQ ADJUSTMENT (RV501)

1. Receive an off-air signal.
2. Connect circuit between pin ㊽ of IC301 (H IN) and pin ㊱ of IC301 (VCC2) with a jumper wire.
3. Connect the frequency counter across Base of Q550 and ground.
4. Adjust RV501 for 15,734kHz±50Hz on the frequency counter.
5. Disconnect a jumper wire from IC301.

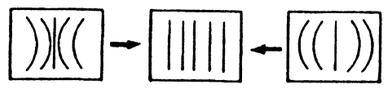
V.FREQ ADJUSTMENT (RV502)

1. Receive an off-air signal.
2. Connect circuit between pin ㊼ of IC301 (V IN) and pin ㊱ of IC301 (VCC2) with a jumper wire.
3. Connect the frequency counter across DY-1 connector (V.DY ⊖) and ground.
4. Adjust RV502 for 55.0±0.3Hz on the frequency counter.
5. Disconnect a jumper wire from IC301.



PIN AMP ADJUSTMENT (RV505)

Adjust pin amplification with RV505.



H.CENT ADJUSTMENT (A-13)

1. Recive a cross-hatch signal.
2. Set PICTURE and BRT to normal.
3. Adjust H.CENT (H.CENT TAP=A-13) for best picture.

V.CENT ADJUSTMENT (S501)

1. Receive a cross-hatch signal.
2. Set PICTURE and BRT to normal.
3. Adjust V.CENT (S501) for best picture.

WARNING !!

When you replace a memory IC, make sure of the functioning remote commander and proper sound with the power switch on.
If you find any troubles, take actions as shown below.

For remote commander :
Set the main power switch to OFF and press it again to turn the unit on.

For sound :
Switch the unit from MAIN to SAP to MONO mode by the MTS switch (or MTS button on the commander) to make sure of sound with MONO mode. Note that the sound is of proper volume and the speaker on/off switch is set to ON.

H.SIZE ADJUSTMENT(RV506)

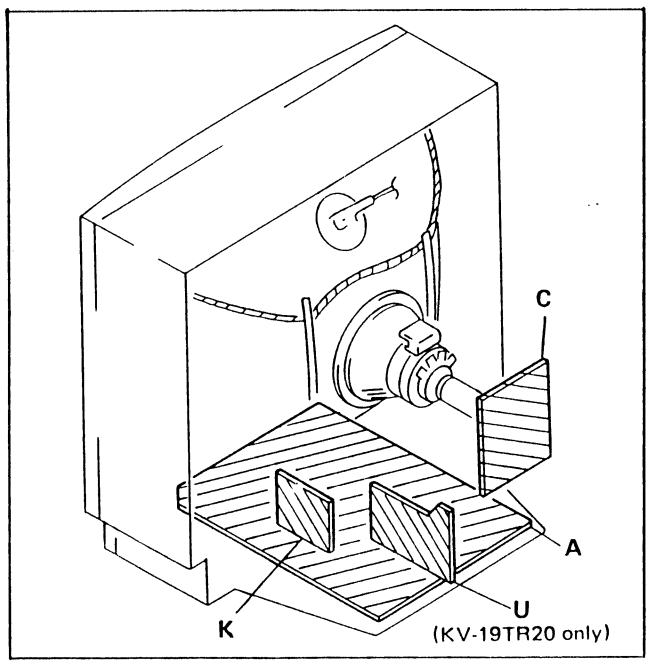
1.Receive across-hatch signal.
2.Adjust RV506 for 15.0 divisions.

V.SIZE ADJUSTMENT(RV507)

1.Receive a cross-hatch signal.
2.Adjust RV507 for 11.25 divisions.

SECTION 6
DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION



6-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS
— Conductor Side —

Note: The components identified by shading and mark ⚠ are critical for safty. Replace only with part number specified.

Note: Les composants identifiés par un tramé et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piece portant le numéro spécifié.

Note:

- All capacitors are in μF unless otherwise noted. p: μμF
  50 WV or less are not indicated except for electrolytic and tantalums.
- All resistors are in ohms.
  kΩ =1000Ω , MΩ =1000KΩ
- Indication of resistance, which does not have one for rating electrical power is as follows.

  Pitch: 5 mm
  Rating electrical power: 1/4W

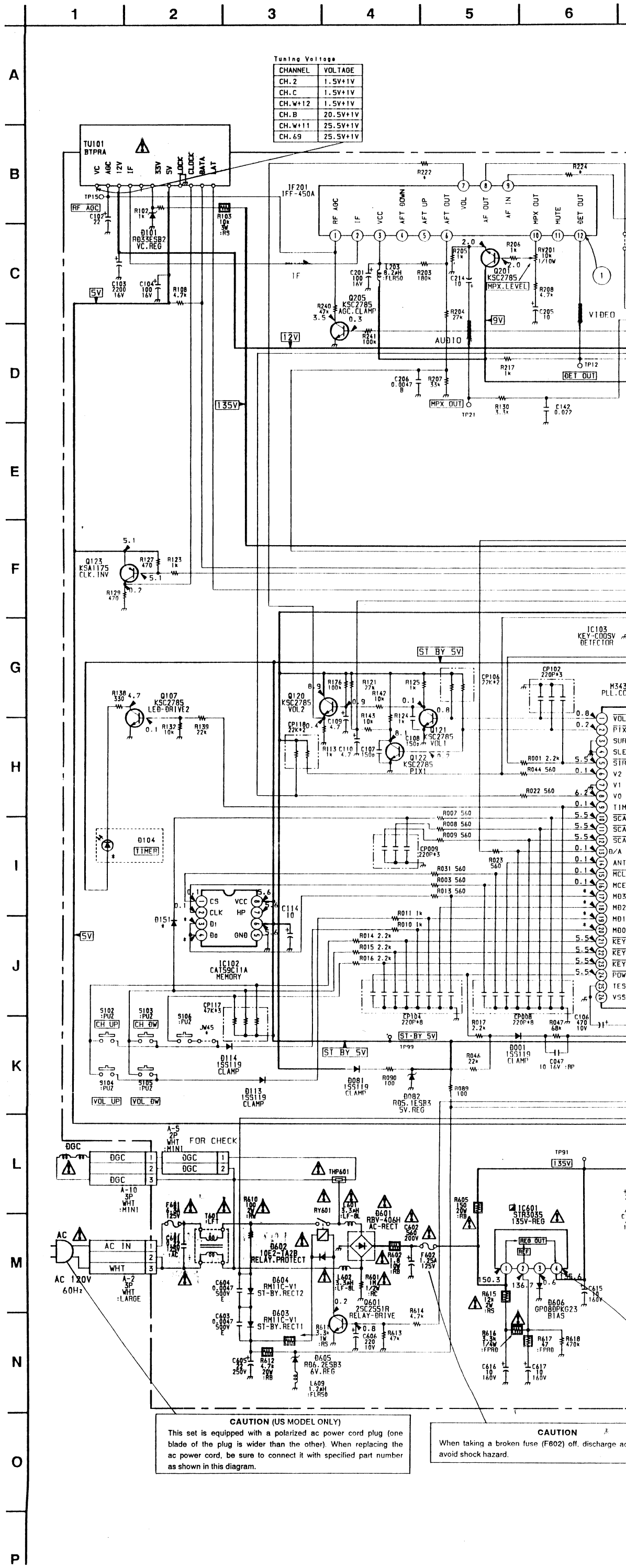
- : nonflamable resistor.
- △ : internal component.
- [ ] : panel designation or adjustment for repair.
- All variable and adjustable resistors have charactristic curve B, unless otherwise noted.
- The components indentified by ⊠ in this manual have been carefully factory-selected for each set in order to satisty regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.
- When replacing components indicated by ◪ mark the necessary adjustments indicated. If results do not meet the specified value, change the component identified by ⊠ and repeat the adjustment until the specified value is achieved. (Refer to R322, 324 adjustment on page 15)
  When replacing the part in below table, be sure to perform the related adjustment.

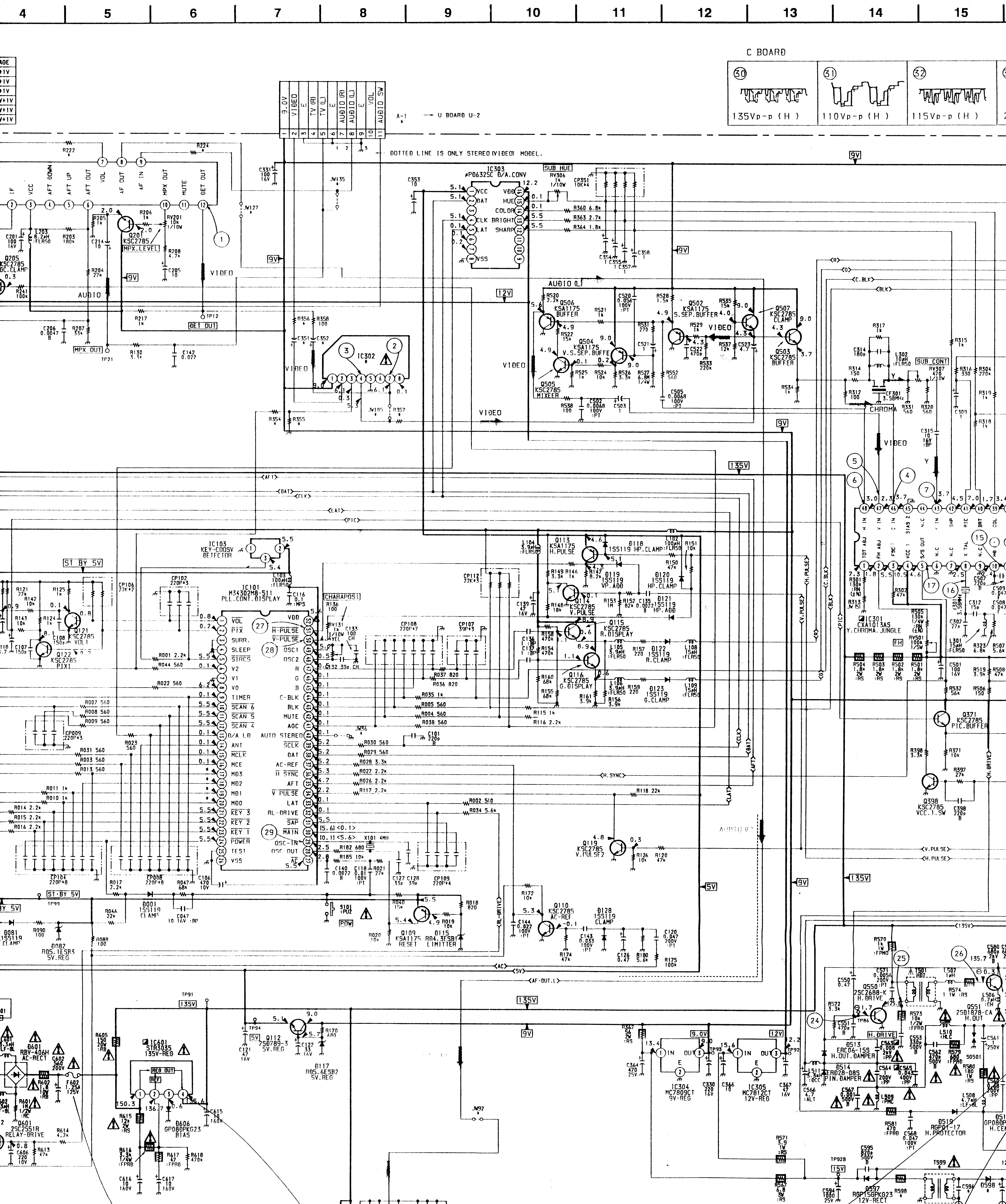
Part replaced (◪)	Adjustment (⊠)
IC301, PM501, D501, R565, R512, R322	R322
iC601, IC301, PM501, D501, D321, C565, C563, R565, R512, R325, R324, T504, DY	R324

Reference information

RESISTOR	RN	: METAL FILM
	RC	: SOLID
	FPRD	: NONFLAMMBLE CARBON
	FUSE	: NONFLAMMBLE FUSIBLE
	RS	: NONFLAMMBLE METAL OXIDE
	RB	: NONFLAMMBLE CEMENT
	RW	: NONFLAMMBLE WIREWOUND
	※	: ADJUSTMENT RESISTOR
COIL	LF-8L	: MICRO INDUCTOR
CAPACITOR	TA	: TANTALUM
	PS	: STYROL
	PP	: POLYPROPYLENE
	PT	: MYLAR
	MPS	: METALIZED POLYESTER
	MPP	: METALIZED POLYPROPYLENE
	ALB	: BIPOLAR
	ALT	: HIGH TEMPERATURE
	ALR	: HIGH RIPPLE

- Readings are taken with a color-bar signal input.
- Readings are taken with a 10 MΩ digital maltimeter.
- Voltage are dc with respect to ground unless otherwise noted.
- Voltage variations may be neted due to normal production tolerances.
- : B+ bus.
- : signal path.




4
5
6
7
8
9
10
11
12
13
14
15
C BOARD
30
135Vp-p (H)
31
110Vp-p (H)
32
115Vp-p (H)
9.0V
VIDEO
E
TV (R)
TV (L)
E
AUDIO (R)
AUDIO (L)
E
VOL
AUDIO SW
A-1
U BOARD U-2
DOTTED LINE IS ONLY STEREO (VIDEO) MODEL.
IF
VCC
AFT DOWN
AFT UP
AFT OUT
VOL
AF OUT
AF IN
MPX OUT
MUTE
DET OUT
Q201
KSC2785
MPX.LEVEL
Q205
KSC2785
AGC.CLAMP
AUDIO
VIDEO
DET OUT
MPX OUT
IC303
μPD6325C D/A.CONV
VCC
DAT
CLK
LAT
VSS
VDD
HUE
COLOR
BRIGHT
SHARP
SUB HUE
RV306
CP351
10K*4
IC302
AUDIO (L)
Q506
KSA1175
BUFFER
Q504
KSA1175
V.S.SEP.BUFFE
Q505
KSC2785
MIXEER
Q502
KSA1175
S.SEP.BUFFER
Q507
KSC2785
CLAMP
Q503
KSC2785
BUFFER
CHROMA
SUB CONT
RV307
CF301
3.58MHz
12V
9V
135V
5V
ST BY 5V
IC103
KEY-COOSV
DETECTOR
IC101
M34302M8-511
PLL.CONT.DISPLAY
VOL
PIX
SURR.
SLEEP
STRCS
V2
V1
V0
TIMER
SCAN 6
SCAN 5
SCAN 4
D/A LD
ANT
MCLK
MCE
MD3
MD2
MD1
MD0
KEY 3
KEY 2
KEY 1
POWER
TEST
VSS
VDD
H-PULSE
V-PULSE
OSC1
OSC2
R
G
B
C-BLK
BLK
MUTE
AGC
AUTO STEREO
SCLK
DAT
AC-REF
H SYNC
AFT
V PULSE
LAT
RL-DRIVE
SAP
MAIN
OSC-IN
OSC OUT
AC
CHARAPOSI
X101 4MH
Q121
KSC2785
VOL1
Q122
KSC2785
PIX1
Q113
KSA1175
H.PULSE
Q114
KSC2785
V.PULSE
Q115
KSC2785
R.DISPLAY
Q116
KSC2785
G.DISPLAY
D118
1SS119 HP.CLAMP
D119
1SS119
VP.ADD
D120
1SS119
HP.CLAMP
D121
1SS119
HP.ADD
D122
1SS119
R.CLAMP
D123
1SS119
G.CLAMP
Q119
KSC2785
V.PULSE2
Q110
KSC2785
AC-REF
D128
1SS119
CLAMP
Q109
KSA1175
RESET
D115
RD4.3ESB1
LIMITTER
S101
POW
D001
1SS119
CLAMP
D081
1SS119
CLAMP
D082
RD5.1ESB3
5V.REG
IC301
CXA1013AS
Y.CHROMA.JUNGLE
H IN
V IN
C IN
BIAS 2
N.C
Y IN
SHP
PIC
BRT
COL
TOT ADJ
FH ADJ
FSC
VCC 1
S/S OUT
X TAL
Q371
KSC2785
PIC.BUFFER
Q398
KSC2785
VCC.1.SW
D601
RBV-406H
AC-RECT
F602
1.25A
125V
Q601
2SC2551R
RELAY-DRIVE
IC601
STR3035
135V-REG
REG OUT
REF
D606
GP08DPKG23
BIAS
TP91
Q112
2SD789-3
5V.REG
D117
RD5.6ESB2
5V.REG
IC304
MC7809CT
9V-REG
IC305
MC7812CT
12V-REG
Q550
2SC2688-K
H.DRIVE
Q551
2SD1878-CA
H.OUT
T501
HDT
D513
ERC06-15S
H.OUT.DAMPER
D514
ERD28-08S
PIN.DAMPER
D519
RGP01-17
H.PROTECTOR
D597
RGP15GPKG23
12V-RECT
T599
135V
135V
E
E
E
AUDIO (L)
E
AUDIO (R)
E
E
E
A-12
11P
:BTOB-P
TO K BOARD K-1

...r cord plug (one ...en replacing the ...fied part number

CAUTION
When taking a broken fuse (F602) off, discharge across C602 to avoid shock hazard.

See page 15

See page 15

CAUTION
When replacing IC601, be sure to check the test point voltage value (TP91). Refer to the Safety Adjustment Section.

C BOARD

30	31	32	33
135Vp-p (H)	110Vp-p (H)	115Vp-p (H)	24 Vp-p (H)

A49JLV50X PICTURE TUBE

KG KB G2 H CV KR G1 G4 HV

C-1 2P WHT :LARGE

C [R·G·B OUT]

SCREEN MIN~MAX 345~834

SUB BRT R G B 9.0V E — A-B 6P WHT :S-MICRO

C-2 6P WHT :MINI: H2 H1 NC E 200V 1000V

C-3 6P WHT :S-MICRO: E 9.0V B G R SUB·BRT

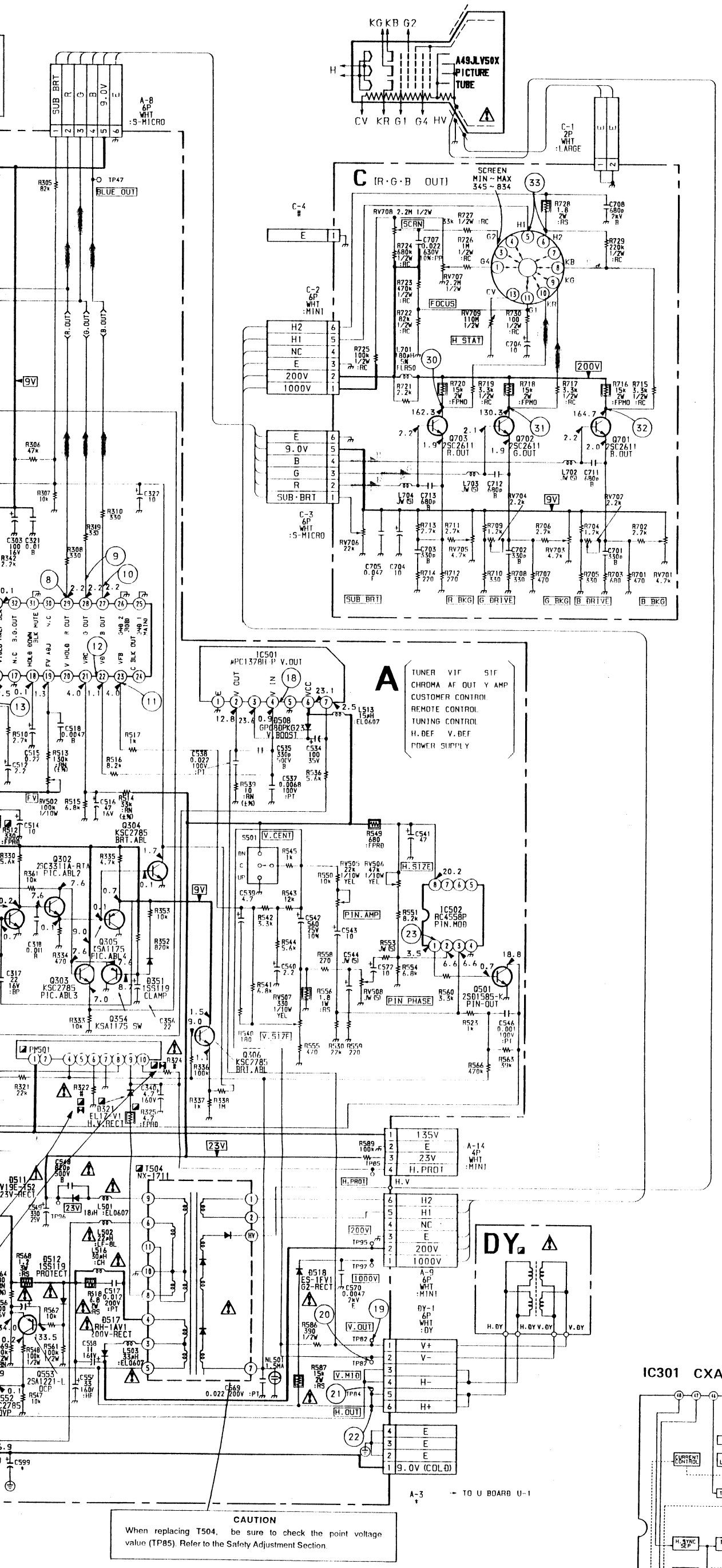
C-4 #: E

A

TUNER VIF SIF
CHROMA AF OUT Y AMP
CUSTOMER CONTROL
REMOTE CONTROL
TUNING CONTROL
H.DEF V.DEF
POWER SUPPLY

CAUTION
When replacing T504, be sure to check the point voltage value (TP85). Refer to the Safety Adjustment Section.

See page 15
See page 15
A-3 → TO U BOARD U-1



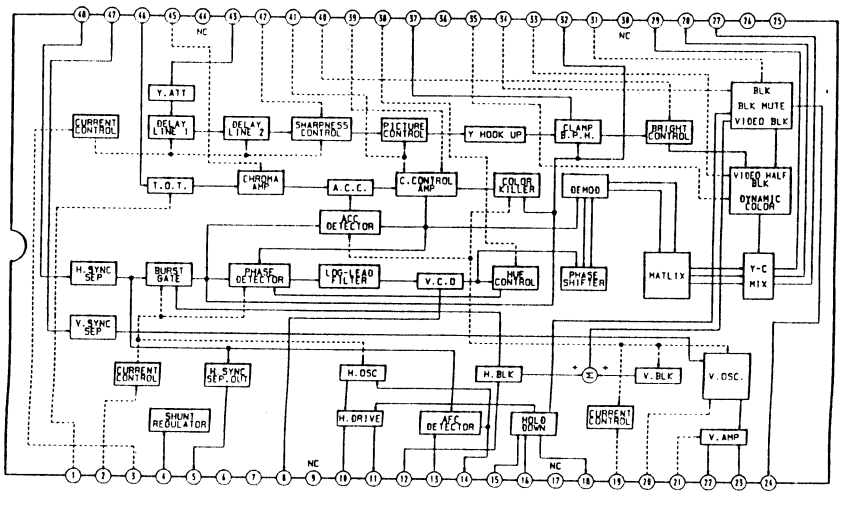
CAUTION

When replacing T504, be sure to check the point voltage value (TP85). Refer to the Safety Adjustment Section.

A BOARD

① 2.4Vp-p (H)	② 2.4Vp-p (H)	③ 2.4Vp-p (H)
④ 2 Vp-p (H)	⑤ 1.8Vp-p (H)	⑥ 1.6Vp-p (H)
⑦ 1.1Vp-p (H)	⑧ 4.4Vp-p (H)	⑨ 4.2Vp-p (H)
⑩ 4.2Vp-p (H)	⑪ 1.9Vp-p (V)	⑫ 2.0Vp-p (V)
⑬ 1.6Vp-p (H)	⑭ 5.0Vp-p (H)	⑮ 5.2Vp-p (H)
⑯ 0.07Vp-p (3.58MHz)	⑰ 4.8Vp-p (H)	⑱ 1.1Vp-p (V)
⑲ 4.8Vp-p (V)	⑳ 6 Vp-p (V)	㉑ 230Vp-p (H)
㉒ 940Vp-p (H)	㉓ 8 Vp-p (V)	㉔ 4.8Vp-p (H)
220Vp-p (H)	10 Vp-p (H)	5 Vp-p (H)
㉘ 5.2Vp-p (V)	㉙ 3.4Vp-p (4MHz)	

IC301 CXA1013AS



KV-19TR10/19TR20 RM-780/RM-781

A (TUNER VIF, SIF, CHROMA, AF OUT, Y AMP, CUSTOMER CONTROL, REMOTE CONTROL, TUNING CONTROL, H.DEF, V.DEF, POWER SUPPLY)

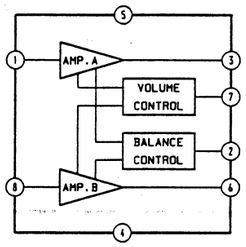
A MOUNT VARIATION LIST

REF	KV-19TR10	KV-19TR20
R130	3.3K	3.3K
R205	1.0K	1.0K
R222	1.0K	1.0K
R224	1.0K	1.0K
R354	---	100
R355	---	22.0K
R356	---	100
R357	JW	100
R398	---	4.8
R599	---	1.5K
C142	0.002	0.002
C205	10	10
C214	10/16	JW
C351	---	47/16
C352	JW	47/16
C596	---	0.0033 630V
C597	---	220 /35
C598	---	33/16
C599	---	220 /16

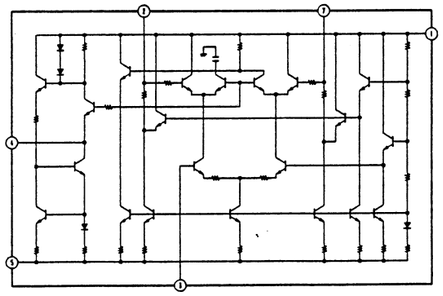
REF	KV-19TR10	KV-19TR20
A-1	---	11P
A-3	---	4P
S106	---	S106
T599	---	T599
D151	1SS119	---
D598	---	ERB43-04
D599	---	RD10ESB2
Q201	KSC2785	KSC2785
Q599	---	2SD789-A

REF	KV-19TR10	KV-19TR20
IC302	---	CX20061-GG

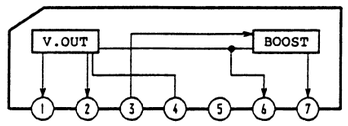
IC203 MB3110A



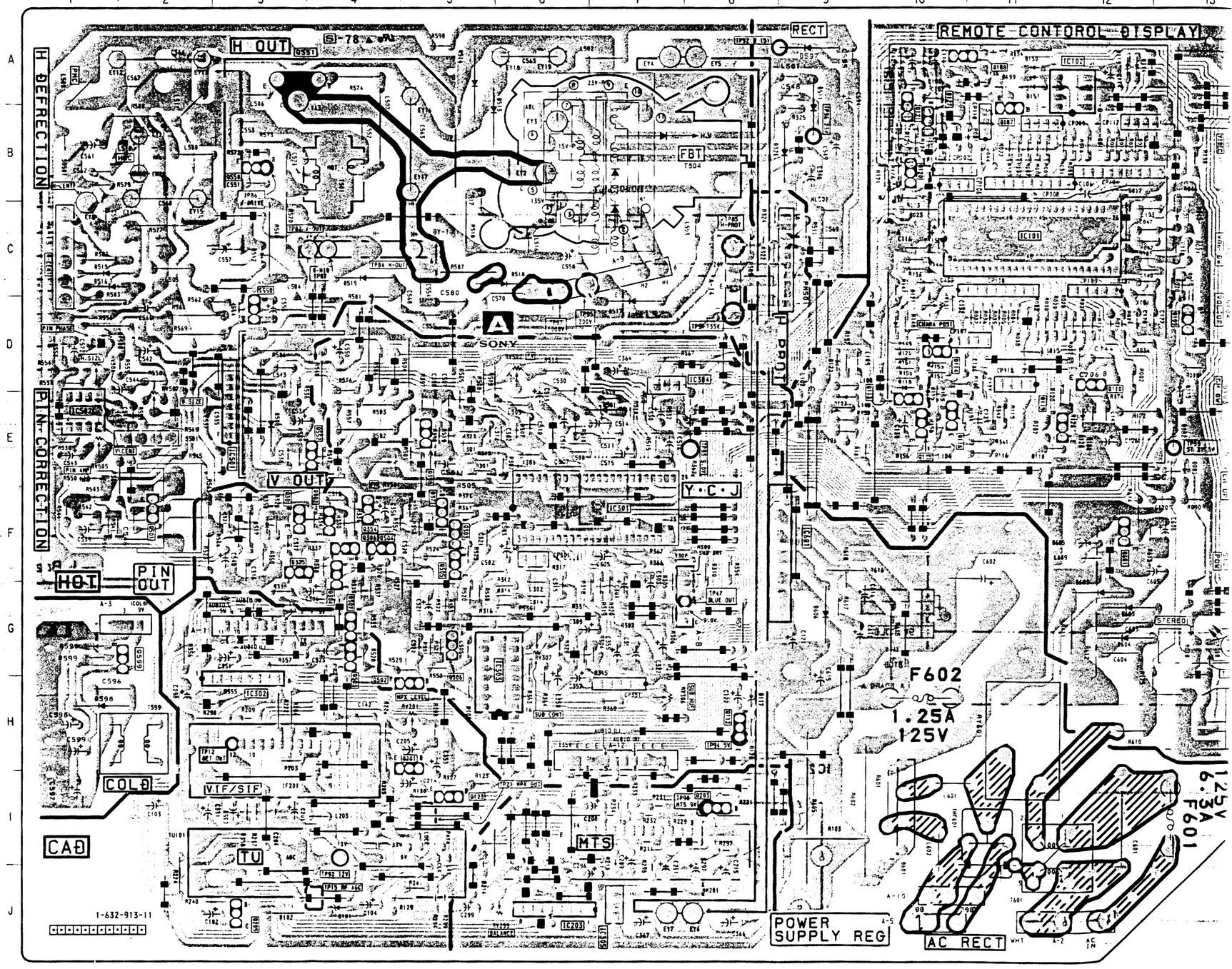
IC302 CX20061



IC501 UPC1378H-P

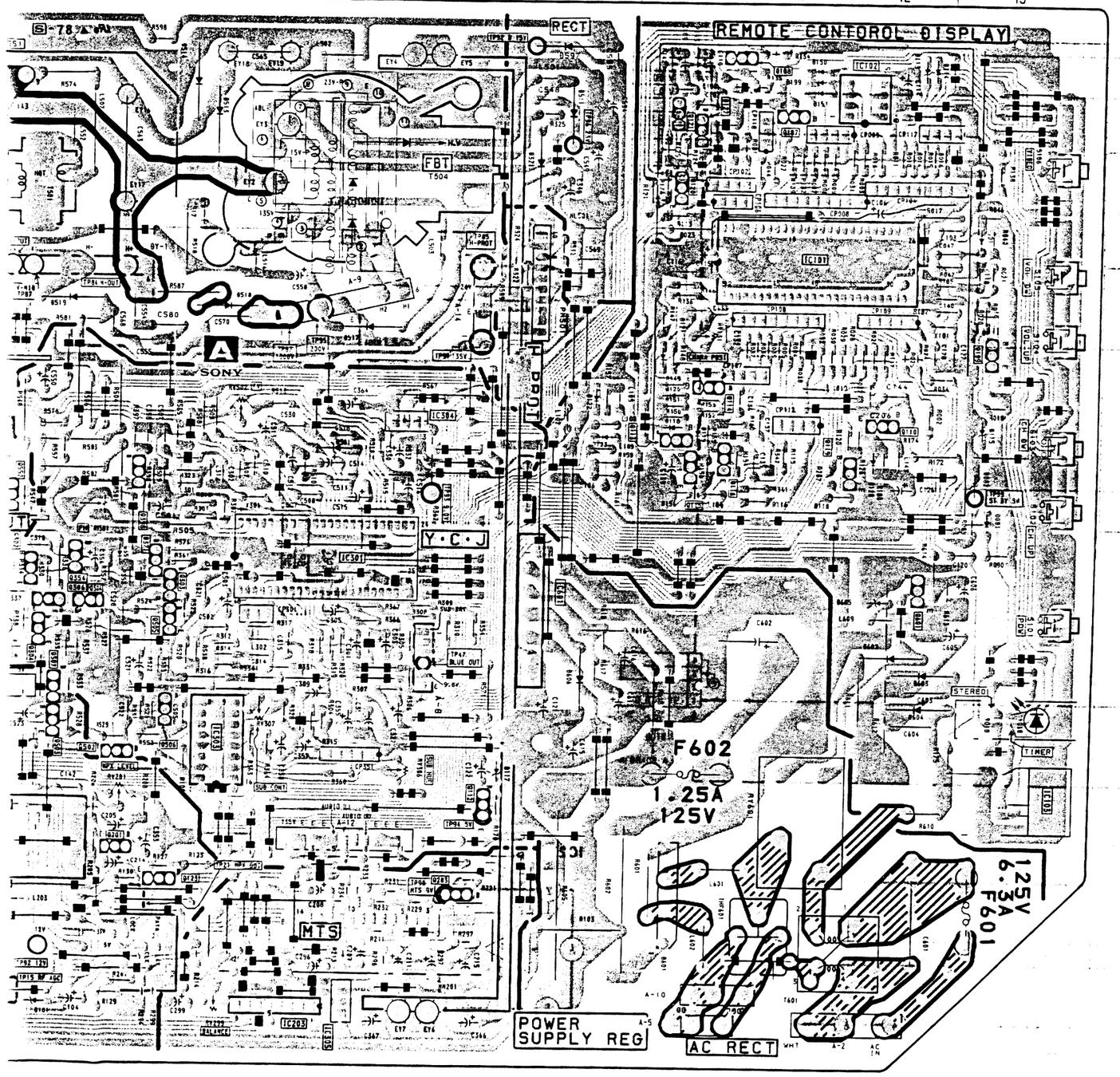


— A Board —



AMP, CUSTOMER CONTROL,
DEF, V.DEF, POWER SUPPLY)

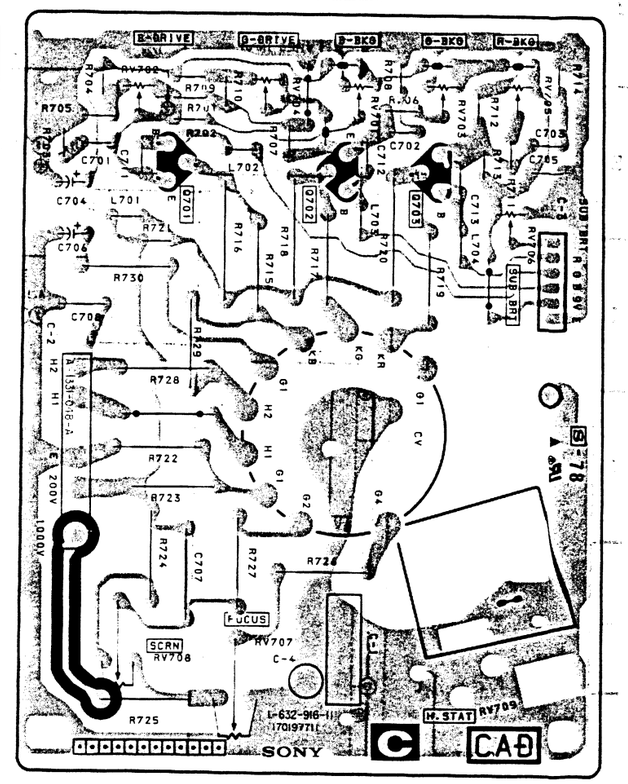
C (R·G·B OUT)



A BOARD

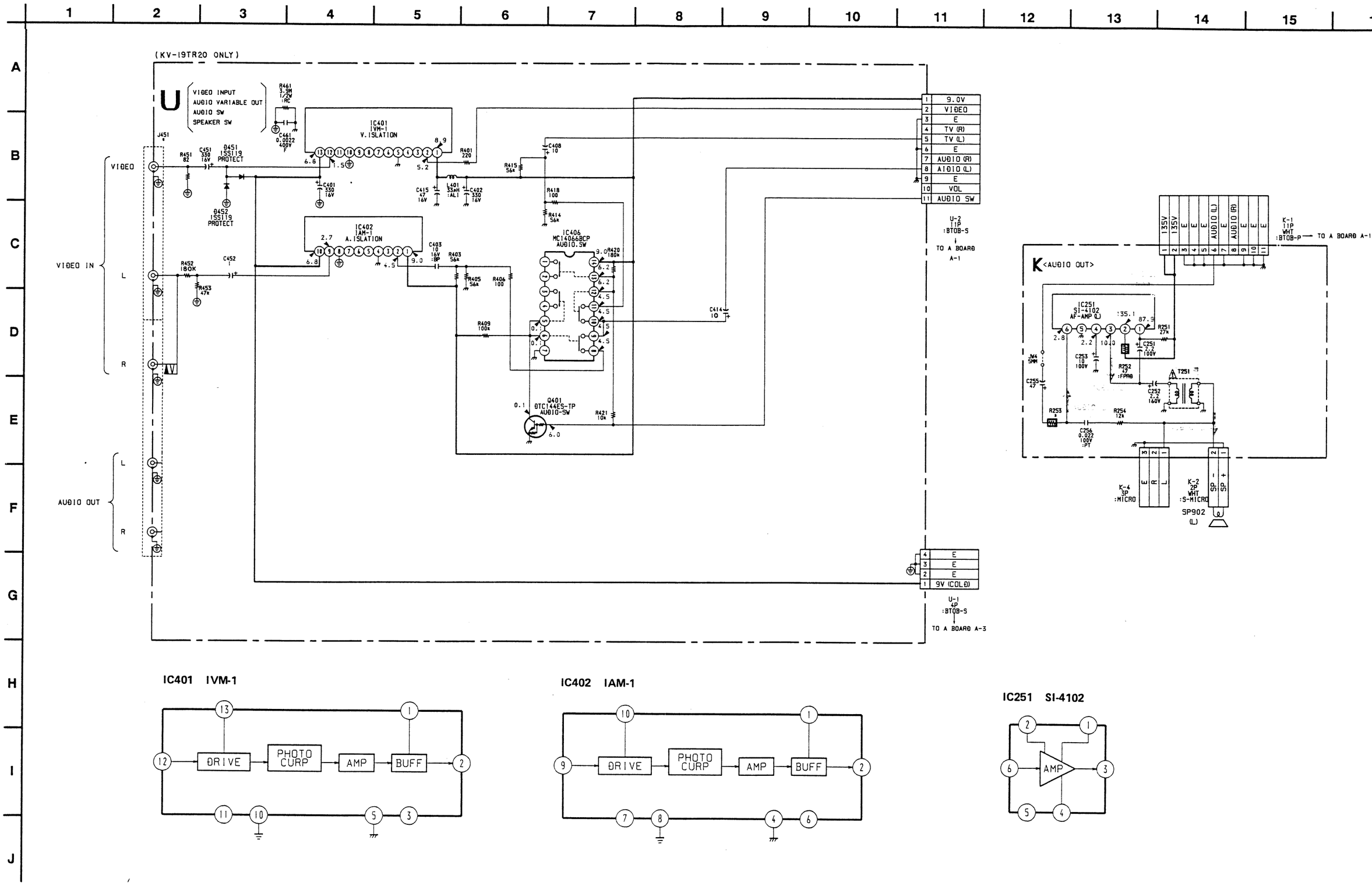
DIODE		IC		RV	
D101	B-9	IC101	C-4	RV101	C-3
D103	C-1	IC102	B-4	RV301	G-5
D113	E-1	IC103	B-1	RV302	F-5
D114	B-1	IC104	F-4	RV303	F-3
D115	B-5	IC105	B-7	RV401	F-7
D126	B-1	IC201	B-10	RV402	E-8
D127	B-1	IC301	H-4	RV501	H-3
D128	A-8	IC401	F-7	RV502	G-5
D241	C-8	IC402	F-8	RV503	H-7
D245	G-6	IC403	F-6	RV504	H-6
D251	B-8	IC501	J-7		
D301	J-6	IC601	E-12		
D317	J-6				
D401	G-9				
D402	G-7				
D403	I-2	TRANSISTOR			
D405	F-8				
D408	G-8	Q109	B-5		
D501	I-7	Q110	A-7		
D502	H-8	Q111	F-3		
D504	F-11	Q113	B-2		
D505	F-11	Q114	B-3		
D508	E-10	Q115	F-2		
D511	G-12	Q116	E-3		
D512	J-11	Q118	C-1		
D513	H-10	Q120	C-6		
D514	J-12	Q121	B-6		
D561	G-12	Q122	C-2		
D601	B-11	Q241	B-7		
D602	C-11	Q250	B-8		
D603	C-12	Q251	B-8		
D604	C-13	Q252	B-8		
D605	A-6	Q301	F-2		
D606	C-5	Q401	F-7		
D607	A-10	Q402	F-8		
D608	A-11	Q403	I-2		
D609	B-10	Q404	E-7		
		Q405	E-7		
		Q407	I-2		
		Q408	H-2		
		Q409	J-2		
		Q410	I-2		
		Q411	G-6		
		Q460	I-3		
		Q501	I-9		
		Q502	I-10		
		Q561	F-13		
		Q562	H-8		
		Q601	B-10		

— C Board —



NOTE:
The circuit indicated as left contains high voltage of over 600 Vp-p. Care must be paid to prevent an electric shock in inspection or repairing.

KV-19TR10/19TR20
RM-780/RM-781



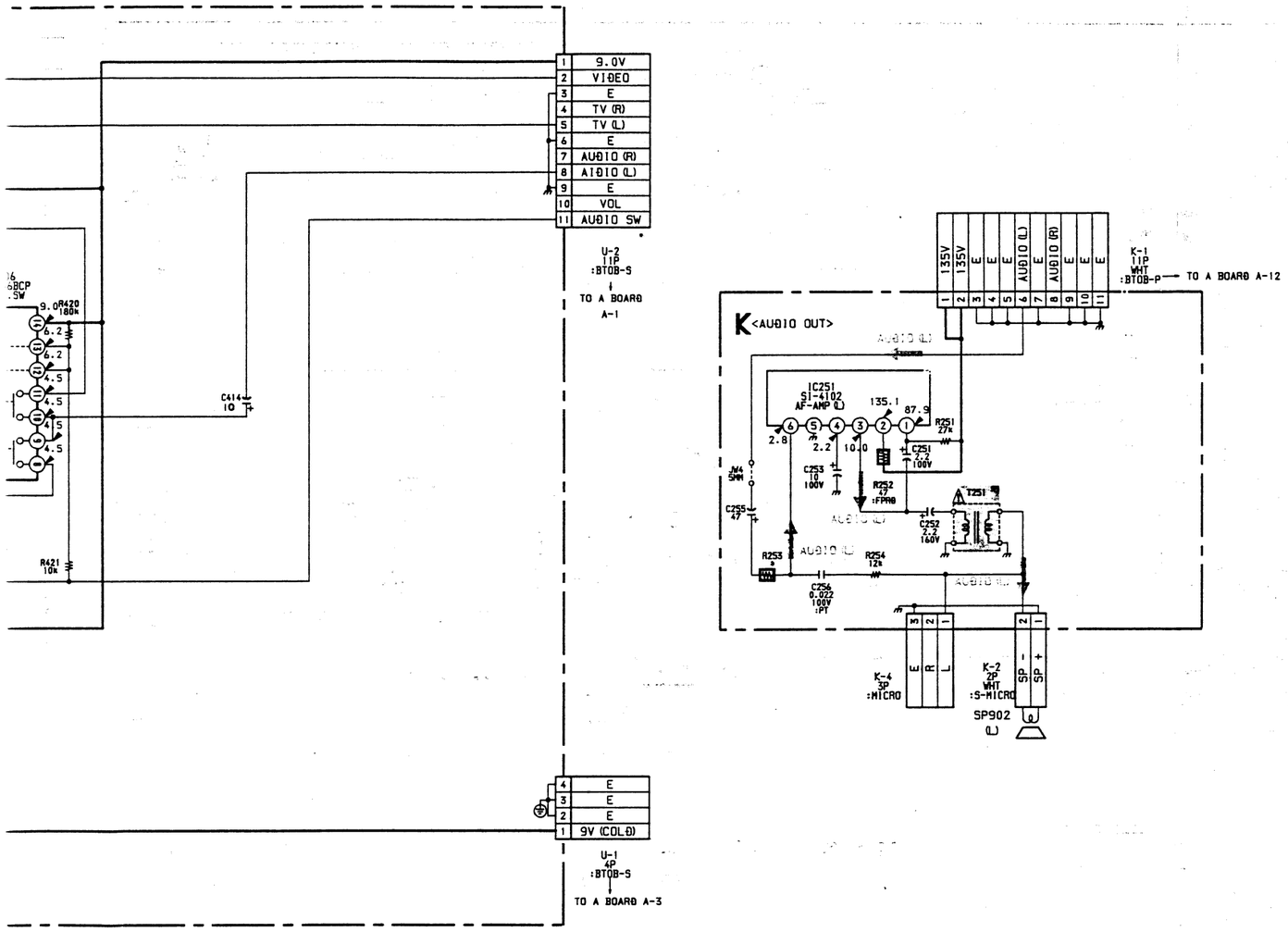
IC401 IVM-1

IC402 IAM-1

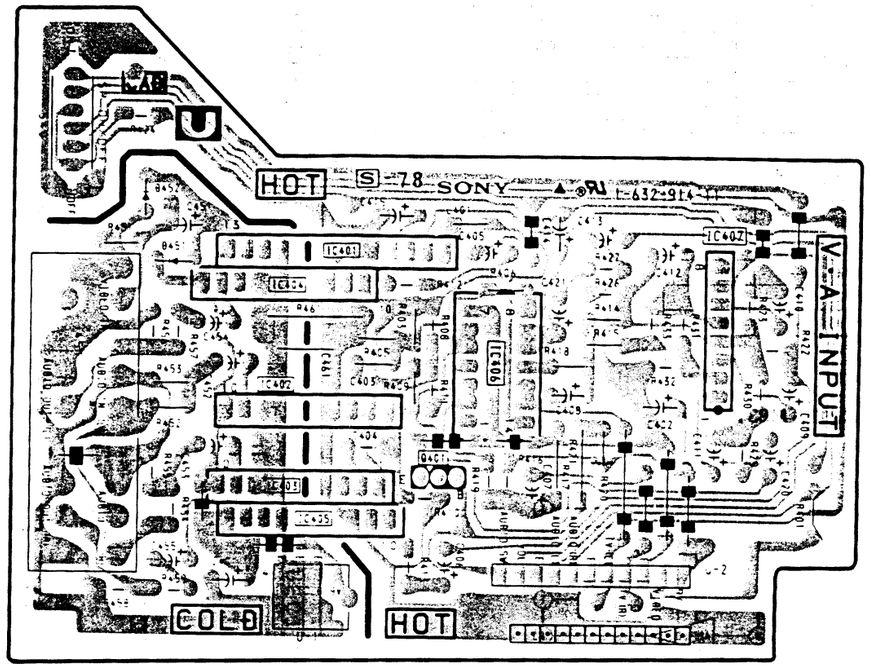
IC251 SI-4102

KV-19TR10/19TR20 RM-780/RM-781

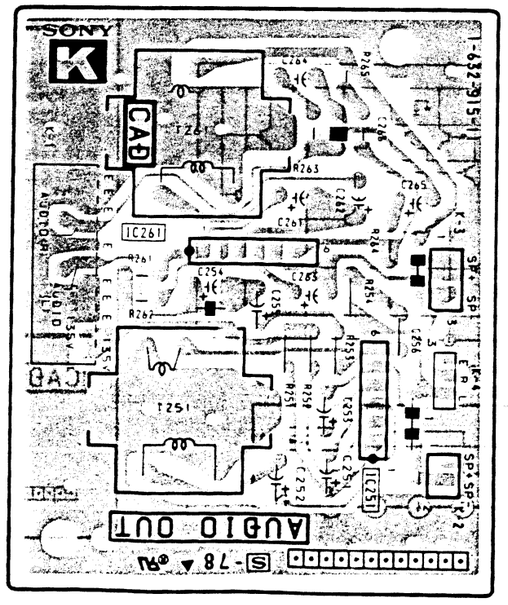
7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | U (VIDEO INPUT, AUDIO VARIABLE OUT, AUDIO SW, SPEAKER SW) | K (AUDIO OUT)



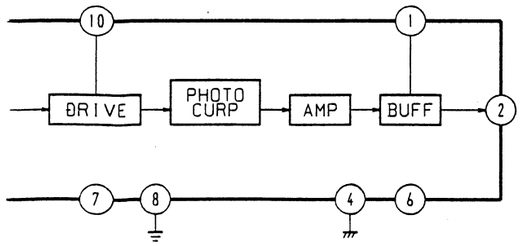
— U Board —



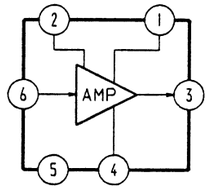
— K Board —



102 IAM-1



IC251 SI-4102



SECTION 7
EXPLODED VIEW

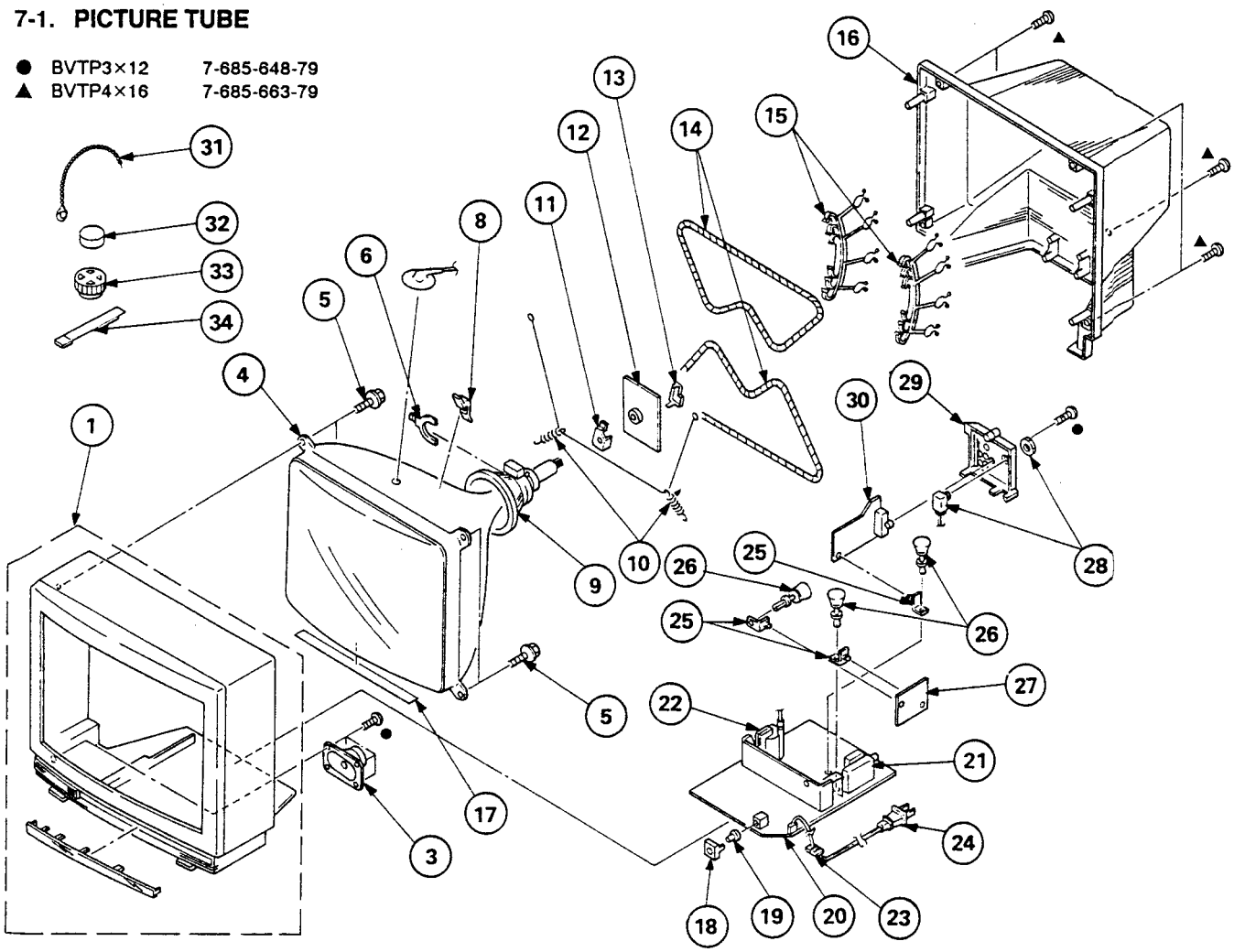
The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

NOTE:
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

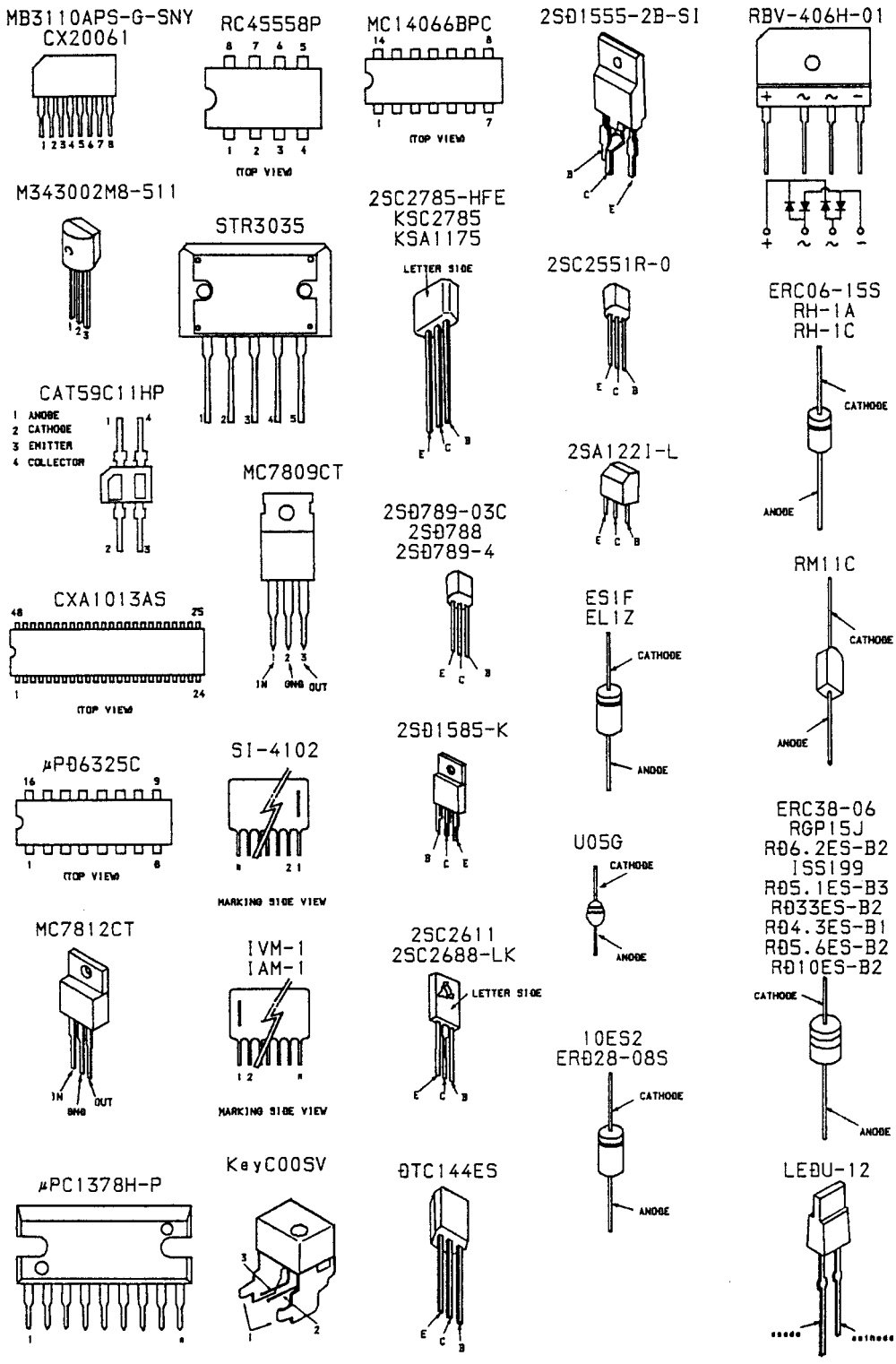
7-1. PICTURE TUBE

● BVTP3×12 7-685-648-79
▲ BVTP4×16 7-685-663-79



REF.NO.	PART NO.	DESCRIPTION	REMARK
1	X-4380-070-1	CABINET ASSY (WITH BEZEL ASSY)	(KV-19TR20 ONLY)
	X-4380-070-2	CABINET ASSY (WITH BEZEL ASSY)	(KV-19TR10 ONLY)
3	1-544-283-11	SPEAKER	
4	⚠8-737-353-05	PICTURE TUBE (A49JLV50X)	
5	4-307-249-00	SCREW (5), TAPPING	
6	1-452-277-00	MAGNET, BMC	
8	3-703-961-01	SPACER, DY	
9	⚠1-451-260-22	DEFLECTION YOKE (Y20NDA)	
10	*4-375-394-01	SPRING, TENSION	
11	*4-374-717-01	COVER (MAIN), CV VOL	
12	*A-1331-048-A	C BOARD, COMPLETE	
13	*4-374-704-01	COVER (REAR LID), CV VOL	
14	⚠1-426-358-11	COIL, DEMAGNETIZATION	
15	*4-341-778-01	BAND, DEGAUSSING COIL	
16	4-397-422-01	COVER, REAR	
17	4-370-595-01	SHEET, BLOTTING	
18	*4-381-686-01	BRACKET (B), LIGHT GUIDE	
19	*4-389-517-01	GUIDE (R), LIGHT	
20	*A-1296-672-A	A BOARD, COMPLETE (KV-19TR20 (USA) ONLY)	
	*A-1296-725-A	A BOARD, COMPLETE (KV-19TR10 (USA) ONLY)	
	*A-1296-727-A	A BOARD, COMPLETE (KV-19TR20 (CND) ONLY)	
	*A-1296-730-A	A BOARD, COMPLETE (KV-19TR10 (CND) ONLY)	
21	⚠1-465-371-11	TUNER, ET (BTP-RA401)	(KV-19TR10 (USA), KV-19TR20 (USA) ONLY)
	⚠1-465-371-21	TUNER, ET (BTP-RA401)	(KV-19TR10 (CND), KV-19TR20 (CND) ONLY)
22	⚠1-439-483-11	TRANSFORMER ASSY, FLYBACK (NX-710)	
23	⚠4-388-328-01	GROMMET, AC CORD	
24	⚠1-559-396-11	CORD, POWER	
25	*4-397-417-01	HOLDER, PC BOARD	
26	*4-397-418-01	RIVET, T TYPE	
27	*1-632-915-11	K BOARD	
28	⚠1-536-678-31	ANTENNA BLOCK	(KV-19TR10 (USA), KV-19TR20 (USA) ONLY)
	⚠1-537-077-21	ANTENNA BLOCK	(KV-19TR10 (CND), KV-19TR20 (CND) ONLY)
29	4-397-423-11	TERMINAL BOARD, ANTENNA (KV-19TR20 ONLY)	
	4-397-423-21	TERMINAL BOARD, ANTENNA (KV-19TR10 ONLY)	
30	*A-1373-214-A	U BOARD, COMPLETE (KV-19TR20 ONLY)	
31	4-308-870-00	CLIP, LEAD WIRE	
32	1-452-032-00	MAGNET, DISK; 10MM ϕ	
33	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM ϕ	
34	X-4308-815-0	PERMALLOY ASSY, CONVERGENCE	

6-3. SEMICONDUCTORS



A

SECTION 8
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

- The components identified by ⋈ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

REF.NO.	PART NO.	DESCRIPTION	REMARK
	*A-1296-672-A	A BOARD, COMPLETE (KV-19TR20 (USA) ONLY)	
		**********	
	*A-1296-725-A	A BOARD, COMPLETE (KV-19TR10 (USA) ONLY)	
		**********	
	*A-1296-727-A	A BOARD, COMPLETE (KV-19TR20 (CND) ONLY)	
		**********	
	*A-1296-730-A	A BOARD, COMPLETE (KV-19TR10 (CND) ONLY)	
		**********	
	*1-506-348-99	PIN, CONNECTOR 3P	
	*1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P	
	*1-508-766-00	PIN, CONNECTOR (5MM PITCH) 4P	
	*1-508-767-00	PIN, CONNECTOR (5MM PITCH) 5P	
	*1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P	
	*1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
	1-533-223-11	CLIP, FUSE	
	*1-559-991-21	CONNECTOR ASSY 1P	
	*1-564-509-11	PLUG, CONNECTOR 6P	
	*1-565-495-11	CONNECTOR, BOARD TO BOARD 4P	
		(KV-19TR20 ONLY)	
	*1-565-502-11	CONNECTOR, BOARD TO BOARD 11P	
	*1-568-536-11	PLUG (MINIATURE DY) 6P	
	*4-341-751-01	EYELET (EY10,EY11,EY12,EY13,EY14,EY15, EY16,EY17,EY18,EY19)	
	*4-341-752-01	EYELET (EY1,EY2,EY3,EY4,EY5,EY6,EY7,EY8)	
	*4-376-533-01	CASE (MAIN), SHIELD	

<CAPACITOR>

C047	1-126-320-11	ELECT	10MF	20%	16V
C101	1-102-110-00	CERAMIC	220PF	10%	50V
C102	1-126-233-11	ELECT	22MF	20%	50V
C103	1-124-556-11	ELECT	2200MF	20%	16V
C104	1-126-101-11	ELECT	100MF	20%	16V
C106	1-119-160-00	ELECT	470MF		10V
C107	1-101-361-00	CERAMIC	150PF	5%	50V
C108	1-101-361-00	CERAMIC	150PF	5%	50V
C109	1-124-927-11	ELECT	4.7MF	20%	50V
C110	1-124-927-11	ELECT	4.7MF	20%	50V
C114	1-123-875-11	ELECT	10MF	20%	50V
C116	1-136-165-00	FILM	0.1MF	5%	50V
C118	1-106-367-00	MYLAR	0.01MF	10%	100V
C120	1-106-383-00	MYLAR	0.047MF		200V
C121	1-124-477-11	ELECT	47MF	20%	16V
C122	1-124-963-11	ELECT	33MF	20%	16V
C126	1-124-902-00	ELECT	0.47MF	20%	50V
C127	1-102-963-00	CERAMIC	33PF	5%	50V
C128	1-102-965-00	CERAMIC	39PF	5%	50V
C132	1-102-965-00	CERAMIC	39PF	5%	50V
C133	1-102-973-00	CERAMIC	100PF	5%	50V
C135	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C136	1-124-499-11	ELECT	1MF	20%	50V
C137	1-124-499-11	ELECT	1MF	20%	50V
C139	1-124-477-11	ELECT	47MF	20%	16V
C140	1-102-121-00	CERAMIC	0.0022MF	10%	50V
C142	1-101-005-00	CERAMIC	0.022MF		50V
C143	1-106-379-12	MYLAR	0.033MF	10%	100V
C144	1-106-375-12	MYLAR	0.022MF	10%	100V
C201	1-126-101-11	ELECT	100MF	20%	16V
C205	1-123-875-11	ELECT	10MF	20%	50V
C206	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C214	1-126-320-11	ELECT	10MF	20%	16V (KV-19TR10 ONLY)
C301	1-124-902-00	ELECT	0.47MF	20%	50V
C302	1-102-961-00	CERAMIC	27PF	5%	50V
C303	1-126-101-11	ELECT	100MF	20%	16V
C305	1-124-902-00	ELECT	0.47MF	20%	50V
C309	1-124-791-11	ELECT	1MF	20%	50V
C312	1-102-951-00	CERAMIC	15PF	5%	50V
C314	1-102-973-00	CERAMIC	100PF	5%	50V
C315	1-126-320-11	ELECT	10MF	20%	16V
C316	1-126-529-11	ELECT	0.47MF	20%	50V
C317	1-124-282-00	ELECT	22MF	20%	16V
C318	1-102-074-00	CERAMIC	0.001MF	10%	50V
C321	1-102-129-00	CERAMIC	0.01MF	10%	50V
C322	1-123-875-11	ELECT	10MF	20%	50V
C330	1-124-120-11	ELECT	220MF	20%	16V
C331	1-126-101-11	ELECT	100MF	20%	16V
C340	1-123-932-00	ELECT	4.7MF	20%	160V
C351	1-124-477-11	ELECT	47MF	20%	16V (KV-19TR20 ONLY)
C352	1-124-477-11	ELECT	47MF	20%	16V (KV-19TR20 ONLY)
C353	1-123-875-11	ELECT	10MF	20%	50V
C354	1-124-791-11	ELECT	1MF	20%	50V
C355	1-124-791-11	ELECT	1MF	20%	50V
C356	1-126-233-11	ELECT	22MF	20%	50V
C357	1-124-791-11	ELECT	1MF	20%	50V
C358	1-124-791-11	ELECT	1MF	20%	50V
C364	1-124-480-11	ELECT	470MF	20%	25V
C366	1-123-875-11	ELECT	10MF	20%	50V
C367	1-124-477-11	ELECT	47MF	20%	16V
C398	1-102-110-00	CERAMIC	220PF	10%	50V
C501	1-126-101-11	ELECT	100MF	20%	16V
C502	1-106-363-00	MYLAR	0.0068MF	10%	100V
C503	1-124-791-11	ELECT	1MF	20%	50V
C505	1-106-363-00	MYLAR	0.0068MF	10%	100V
C507	1-102-110-00	CERAMIC	220PF	10%	50V
C508	1-101-006-00	CERAMIC	0.047MF		50V
C509	1-101-006-00	CERAMIC	0.047MF		50V
C510	1-106-363-00	MYLAR	0.0068MF	10%	100V
C511	1-106-379-12	MYLAR	0.033MF	10%	100V
C512	1-124-925-11	ELECT	2.2MF	20%	50V
C513	1-124-791-11	ELECT	1MF	20%	50V

A

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
C514	1-123-875-11	ELECT	10MF	20%	50V	
C515	1-124-464-11	ELECT	0.22MF	20%	50V	
C516	1-124-477-11	ELECT	47MF	20%	16V	
C517	⚠1-106-369-91	MYLAR	0.012MF	5%	200V	
C518	1-102-125-00	CERAMIC	0.0047MF	10%	50V	
C520	1-106-385-00	MYLAR	0.056MF	10%	100V	
C521	1-124-791-11	ELECT	1MF	20%	50V	
C522	1-102-824-00	CERAMIC	470PF	5%	50V	
C523	1-124-927-11	ELECT	4.7MF	20%	50V	
C530	1-124-277-11	ELECT	4.7MF	20%	25V	
C534	1-124-122-11	ELECT	100MF	20%	35V	
C535	1-102-030-00	CERAMIC	330PF	10%	500V	
C537	1-106-363-00	MYLAR	0.0068MF	10%	100V	
C538	1-106-375-12	MYLAR	0.022MF	10%	100V	
C539	1-124-927-11	ELECT	4.7MF	20%	50V	
C540	1-124-925-11	ELECT	2.2MF	20%	50V	
C541	1-124-910-11	ELECT	47MF	20%	50V	
C542	1-123-587-00	ELECT	560MF	10%	25V	
C543	1-123-875-11	ELECT	10MF	20%	50V	
C546	1-106-343-00	MYLAR	0.001MF	10%	100V	
C548	⚠1-102-212-91	CERAMIC	820PF	10%	500V	
C549	1-124-479-11	ELECT	330MF	20%	25V	
C550	1-124-902-00	ELECT	0.47MF	20%	50V	
C551	1-102-114-00	CERAMIC	470PF	10%	50V	
C552	⚠1-162-135-91	CERAMIC	560PF	10%	2KV	
C553	1-102-030-00	CERAMIC	330PF	10%	500V	
C554	⚠1-162-116-91	CERAMIC	680PF	10%	2KV	
C555	⚠1-108-375-91	MYLAR	0.0068MF	10%	100V	
C556	1-126-101-11	ELECT	100MF	20%	16V	
C557	1-123-024-21	ELECT	33MF		160V	
C558	1-124-046-00	ELECT	10MF	20%	160V	
C559	1-106-391-12	MYLAR	0.1MF	10%	200V	
C560	⚠1-136-109-11	FILM	0.68MF	5%	200V	
C561	1-124-634-11	ELECT	1MF	20%	250V	
C562	⚠1-102-228-91	CERAMIC	470PF	10%	500V	
C563	⚠1-136-966-11	FILM	0800000000P	3%	2KV	
C564	⚠1-136-111-11	FILM	1MF	5%	200V	
C565	⚠1-136-312-51	FILM	0.043MF	5%	400V	
C566	1-124-045-00	ELECT	4.7MF	20%	50V	
C567	⚠1-162-318-91	CERAMIC	0.001MF	10%	500V	
C568	1-106-383-00	MYLAR	0.047MF	10%	100V	
C569	1-106-375-12	MYLAR	0.022MF		200V	
C570	1-162-114-00	CERAMIC	0.0047MF		2KV	
C571	1-106-361-00	MYLAR	0.0056MF		200V	
C572	1-123-875-11	ELECT	10MF	20%	50V	
C580	⚠1-162-116-91	CERAMIC	680PF	10%	2KV	
C594	1-124-557-11	ELECT	1000MF	20%	25V	
C595	1-102-212-00	CERAMIC	820PF	10%	500V	
C596	1-136-557-11	FILM	0.0033MF	10%	630V (KV-19TR20 ONLY)	
C597	1-124-484-11	ELECT	220MF	20%	35V (KV-19TR20 ONLY)	
C598	1-124-963-11	ELECT	33MF	20%	16V (KV-19TR20 ONLY)	
C599	1-124-120-11	ELECT	220MF	20%	16V (KV-19TR20 ONLY)	
C601	⚠1-108-745-52	MYLAR	0.22MF	20%	125V	
C602	⚠1-125-594-11	ELECT	560MF	20%	200V	
C603	1-161-830-00	CERAMIC	0.0047MF		500V	
C604	1-161-830-00	CERAMIC	0.0047MF		500V	
C605	1-123-948-00	ELECT	22MF	20%	250V	
C606	1-126-176-11	ELECT	220MF	20%	10V	
C615	1-124-046-00	ELECT	10MF	20%	160V	
C616	1-124-046-00	ELECT	10MF	20%	160V	
C617	1-124-046-00	ELECT	10MF	20%	160V	

<FILTER>

CF301	1-409-344-00	CERAMIC TRAP 3.58MHZ

<COMPOSITION CIRCUIT BLOCK>

CP008	1-233-147-11	COMPOSITION CIRCUIT BLOCK
CP009	1-233-145-11	COMPOSITION CIRCUIT BLOCK
CP102	1-233-145-11	COMPOSITION CIRCUIT BLOCK
CP104	1-233-147-11	COMPOSITION CIRCUIT BLOCK
CP106	1-236-357-11	NETWORK, RES
CP107	1-233-146-11	COMPOSITION CIRCUIT BLOCK
CP108	1-233-118-11	COMPOSITION CIRCUIT BLOCK
CP109	1-233-117-11	COMPOSITION CIRCUIT BLOCK
CP112	1-236-490-11	NETWORK, RES, THICK FILM
CP117	1-236-078-11	NETWORK, RES, THICK FILM
CP118	1-236-357-11	NETWORK, RES
CP351	1-236-491-11	NETWORK, RES, THICK FILM

<DIODE>

D001	8-719-911-19	DIODE ISS119
D081	8-719-911-19	DIODE ISS119
D082	8-719-109-86	DIODE RD5.1ES-B3
D101	8-719-110-78	DIODE RD33ES-B2
D104	1-808-919-11	LED UNIT (LEDU-9)
D113	8-719-911-19	DIODE ISS119
D114	8-719-911-19	DIODE ISS119
D115	8-719-109-74	DIODE RD4.3ES-B1
D117	8-719-109-89	DIODE RD5.6ES-B2
D118	8-719-911-19	DIODE ISS119
D119	8-719-911-19	DIODE ISS119
D120	8-719-911-19	DIODE ISS119
D121	8-719-911-19	DIODE ISS119
D122	8-719-911-19	DIODE ISS119
D123	8-719-911-19	DIODE ISS119
D128	8-719-911-19	DIODE ISS119
D151	8-719-911-19	DIODE ISS119 (KV-19TR10 ONLY)
D321	8-719-302-43	DIODE EL1Z
D350	8-719-911-19	DIODE ISS119
D351	8-719-911-19	DIODE ISS119
D501	8-719-109-89	DIODE RD5.6ES-B2
D508	8-719-911-55	DIODE U05G
D511	⚠8-719-901-93	DIODE V19E
D512	⚠8-719-911-19	DIODE ISS119
D513	8-719-945-80	DIODE ERC06-15S
D514	8-719-928-08	DIODE ERD28-08S
D515	8-719-911-55	DIODE U05G
D516	8-719-911-55	DIODE U05G
D517	⚠8-719-303-21	DIODE RH-1AV1
D518	⚠8-719-300-65	DIODE ESIF
D519	8-719-976-64	DIODE RGP02-17
D597	8-719-901-58	DIODE RGP15J
D598	8-719-300-70	DIODE RH-1C (KV-19TR20 ONLY)
D599	8-719-110-17	DIODE RD10ES-B2 (KV-19TR20 ONLY)
D601	⚠8-719-305-07	DIODE RBV-406H
D602	⚠8-719-200-02	DIODE 10E2
D603	8-719-304-63	DIODE
D604	8-719-304-63	DIODE
D605	8-719-109-93	DIODE RD6.2ES-B3
D606	8-719-911-55	DIODE U05G

A

- The components identified by ⊠ in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION				REMARK
R029	1-249-414-11	CARBON	560	5%	1/4W	
R030	1-249-414-11	CARBON	560	5%	1/4W	
R031	1-249-414-11	CARBON	560	5%	1/4W	
R034	1-249-426-11	CARBON	5.6K	5%	1/4W	
R035	1-249-417-11	CARBON	1K	5%	1/4W	
R036	1-249-416-11	CARBON	820	5%	1/4W	
R037	1-249-416-11	CARBON	820	5%	1/4W	
R038	1-249-414-11	CARBON	560	5%	1/4W	
R040	1-249-431-11	CARBON	15K	5%	1/4W	
R044	1-249-414-11	CARBON	560	5%	1/4W	
R046	1-249-433-11	CARBON	22K	5%	1/4W	
R047	1-249-439-11	CARBON	68K	5%	1/4W	
R089	1-249-405-11	CARBON	100	5%	1/4W	
R090	1-249-405-11	CARBON	100	5%	1/4W	
R102	1-249-417-11	CARBON	1K	5%	1/4W	
R103	1-215-923-00	METAL OXIDE	10K	5%	3W	F
R108	1-249-425-11	CARBON	4.7K	5%	1/4W	
R113	1-249-417-11	CARBON	1K	5%	1/4W	
R115	1-249-417-11	CARBON	1K	5%	1/4W	
R116	1-249-421-11	CARBON	2.2K	5%	1/4W	
R117	1-249-421-11	CARBON	2.2K	5%	1/4W	
R118	1-249-433-11	CARBON	22K	5%	1/4W	
R120	1-249-437-11	CARBON	47K	5%	1/4W	
R121	1-249-434-11	CARBON	27K	5%	1/4W	
R123	1-249-417-11	CARBON	1K	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	
R125	1-249-417-11	CARBON	1K	5%	1/4W	
R126	1-249-429-11	CARBON	10K	5%	1/4W	
R127	1-249-413-11	CARBON	470	5%	1/4W	
R129	1-249-413-11	CARBON	470	5%	1/4W	
R130	1-249-423-11	CARBON	3.3K	5%	1/4W	
R132	1-249-429-11	CARBON	10K	5%	1/4W	
R136	1-249-405-11	CARBON	100	5%	1/4W	
R138	1-249-411-11	CARBON	330	5%	1/4W	
R139	1-249-433-11	CARBON	22K	5%	1/4W	
R142	1-249-429-11	CARBON	10K	5%	1/4W	
R143	1-249-429-11	CARBON	10K	5%	1/4W	
R146	1-249-417-11	CARBON	1K	5%	1/4W	
R147	1-249-428-11	CARBON	8.2K	5%	1/4W	
R148	1-249-432-11	CARBON	18K	5%	1/4W	
R149	1-249-423-11	CARBON	3.3K	5%	1/4W	
R150	1-249-437-11	CARBON	47K	5%	1/4W	
R151	1-249-429-11	CARBON	10K	5%	1/4W	
R152	1-249-440-11	CARBON	82K	5%	1/4W	
R153	1-247-903-00	CARBON	1M	5%	1/4W	
R154	1-247-895-00	CARBON	470K	5%	1/4W	
R155	1-249-439-11	CARBON	68K	5%	1/4W	
R156	1-249-424-11	CARBON	3.9K	5%	1/4W	
R157	1-249-409-11	CARBON	220	5%	1/4W	
R158	1-247-895-00	CARBON	470K	5%	1/4W	
R159	1-249-409-11	CARBON	220	5%	1/4W	
R160	1-249-439-11	CARBON	68K	5%	1/4W	
R161	1-249-424-11	CARBON	3.9K	5%	1/4W	
R170	1-249-415-11	CARBON	680	5%	1/4W	
R172	1-249-429-11	CARBON	10K	5%	1/4W	
R174	1-249-437-11	CARBON	47K	5%	1/4W	
R175	1-249-441-11	CARBON	100K	5%	1/4W	
R176	1-249-441-11	CARBON	100K	5%	1/4W	
R180	1-249-426-11	CARBON	5.6K	5%	1/4W	
R182	1-249-415-11	CARBON	680	5%	1/4W	
R185	1-249-429-11	CARBON	10K	5%	1/4W	
R203	1-247-885-00	CARBON	180K	5%	1/4W	
R204	1-249-434-11	CARBON	27K	5%	1/4W	
R205	1-249-417-11	CARBON	1K	5%	1/4W	
R206	1-249-417-11	CARBON	1K	5%	1/4W	
R207	1-249-435-11	CARBON	33K	5%	1/4W	
R208	1-249-425-11	CARBON	4.7K	5%	1/4W	
R209	1-249-417-11	CARBON	1K	5%	1/4W	
R217	1-249-417-11	CARBON	1K	5%	1/4W	
R222	1-249-417-11	CARBON	1K	5%	1/4W	
R224	1-249-417-11	CARBON	1K	5%	1/4W	
R240	1-249-437-11	CARBON	47K	5%	1/4W	
R241	1-249-441-11	CARBON	100K	5%	1/4W	
R301	1-215-472-00	METAL	130K	1%	1/6W	
R302	1-249-438-11	CARBON	56K	5%	1/4W	
R304	1-247-889-00	CARBON	270K	5%	1/4W	
R305	1-249-440-11	CARBON	82K	5%	1/4W	
R306	1-249-437-11	CARBON	47K	5%	1/4W	
R307	1-249-429-11	CARBON	10K	5%	1/4W	
R308	1-249-411-11	CARBON	330	5%	1/4W	
R309	1-249-411-11	CARBON	330	5%	1/4W	
R310	1-249-411-11	CARBON	330	5%	1/4W	
R312	1-249-405-11	CARBON	100	5%	1/4W	
R313	1-249-427-11	CARBON	6.8K	5%	1/4W	
R314	1-249-407-11	CARBON	150	5%	1/4W	
R315	1-249-417-11	CARBON	1K	5%	1/4W	
R316	1-249-411-11	CARBON	330	5%	1/4W	
R317	1-249-419-11	CARBON	1.5K	5%	1/4W	
R318	1-249-417-11	CARBON	1K	5%	1/4W	
R319	1-249-417-11	CARBON	1K	5%	1/4W	
R320	1-249-417-11	CARBON	1K	5%	1/4W	
R321	1-249-433-11	CARBON	22K	5%	1/4W	
⊠R322 ⚠		CARBON			1/4W	
R323	1-249-427-11	CARBON	6.8K	5%	1/4W	
⊠R324 ⚠		CARBON			1/4W	
R325	1-249-389-11	CARBON	4.7	5%	1/4W	F
R328	1-249-419-11	CARBON	1.5K	5%	1/4W	
R329	1-249-441-11	CARBON	100K	5%	1/4W	
R330	1-249-426-11	CARBON	5.6K	5%	1/4W	
R331	1-249-417-11	CARBON	1K	5%	1/4W	
R333	1-249-429-11	CARBON	10K	5%	1/4W	
R334	1-249-413-11	CARBON	470	5%	1/4W	
R335	1-249-425-11	CARBON	4.7K	5%	1/4W	
R336	1-247-895-00	CARBON	470K	5%	1/4W	
R337	1-249-417-11	CARBON	1K	5%	1/4W	
R338	1-247-903-00	CARBON	1M	5%	1/4W	
R341	1-249-417-11	CARBON	1K	5%	1/4W	
R342	1-249-421-11	CARBON	2.2K	5%	1/4W	
R350	1-249-437-11	CARBON	47K	5%	1/4W	
R352	1-247-901-11	CARBON	820K	5%	1/4W	
R353	1-249-429-11	CARBON	10K	5%	1/4W	
R354	1-249-405-11	CARBON	100	5%	1/4W	(KV-19TR20 ONLY)
R355	1-249-433-11	CARBON	22K	5%	1/4W	(KV-19TR20 ONLY)
R356	1-249-405-11	CARBON	100	5%	1/4W	(KV-19TR20 ONLY)
R357	1-249-405-11	CARBON	100	5%	1/4W	(KV-19TR20 ONLY)
R358	1-249-405-11	CARBON	100	5%	1/4W	
R360	1-249-426-11	CARBON	5.6K	5%	1/4W	
R361	1-249-429-11	CARBON	10K	5%	1/4W	
R362	1-215-907-11	METAL OXIDE	22	5%	3W	F
R363	1-249-422-11	CARBON	2.7K	5%	1/4W	
R364	1-249-420-11	CARBON	1.8K	5%	1/4W	
R366	1-249-430-11	CARBON	12K	5%	1/4W	
R367	1-249-436-11	CARBON	39K	5%	1/4W	
R371	1-249-429-11	CARBON	10K	5%	1/4W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION	REMARK
		<FUSE>	
F601 ⚠	1-532-748-11	FUSE, GLASS TUBE 6.3A/125V	
F602 ⚠	1-532-741-11	FUSE, GLASS TUBE 1.25A/125V	
		<IC>	
IC101	8-759-634-46	IC M34302M8-511	
IC102	8-759-748-69	IC CAT59C11HP	
IC103	8-749-920-65	IC KEY-C005V	
IC301	8-752-031-72	IC CXA1013AS	
IC302 ⚠	8-752-006-12	IC CX20061 (KV-19TR20 ONLY)	
IC303	8-759-104-05	IC UPD6325C	
IC304	8-759-982-10	IC RC7809FA	
IC305	8-759-013-09	IC MC7812CT	
IC501	8-759-105-82	IC UPC1378H P	
IC502	8-759-945-58	IC RC4558P	
IC601 ⚠	8-749-930-35	IC STR3035	
	*4-363-404-00	HOLDER, IC; IC601	
	4-369-267-01	SPACER, MICA; IC601	
		<IF BLOCK>	
IF201	1-464-756-21	IF BLOCK (IFF-450A)	
		<COIL>	
L102	1-408-421-00	INDUCTOR 100UH	
L103	1-408-421-00	INDUCTOR 100UH	
L104	1-408-404-00	INDUCTOR 3.9UH	
L105	1-408-404-00	INDUCTOR 3.9UH	
L106	1-408-404-00	INDUCTOR 3.9UH	
L108	1-410-472-41	INDUCTOR 15UH	
L109	1-410-472-41	INDUCTOR 15UH	
L203	1-408-408-00	INDUCTOR 8.2UH	
L301	1-410-472-41	INDUCTOR 15UH	
L302	1-410-473-11	INDUCTOR 18UH	
L501 ⚠	1-410-666-41	INDUCTOR 18UH	
L502 ⚠	1-408-938-11	INDUCTOR 22UH	
L503 ⚠	1-410-669-41	INDUCTOR 33UH	
L505	1-459-104-00	COIL, WITH CORE	
L506	1-407-365-00	COIL,CHOKE	
L507	1-408-349-00	COIL, CHOKE	
L508	1-408-239-00	INDUCTOR 4.7MMH	
L509 ⚠	1-459-390-11	COIL (WITH CORE)	
L510 ⚠	1-459-316-12	COIL, FERRITE (HLC)	
L511	1-459-075-00	COIL,DYNAMIC CONVERSION CHOKE	
L513	1-410-665-31	INDUCTOR 15UH	
L516 ⚠	1-459-407-11	COIL, FERRITE CHOKE	
L601 ⚠	1-408-225-11	INDUCTOR 3.3UH	
L602 ⚠	1-408-225-11	INDUCTOR 3.3UH	
L609	1-410-459-11	INDUCTOR 1.2UH	
		<NEON LAMP>	
NL501	1-519-108-99	LAMP, NEON	
		<MODULE>	
PM501	1-808-979-11	MODULE PROTECTOR (PM-17)	
		<TRANSISTOR>	
Q107	8-729-922-69	TRANSISTOR KSC2785	
Q109	8-729-922-68	TRANSISTOR KSA1175	
Q110	8-729-922-69	TRANSISTOR KSC2785	
Q112	8-729-320-62	TRANSISTOR 2SD789-34	
Q113	8-729-922-68	TRANSISTOR KSA1175	
Q114	8-729-922-69	TRANSISTOR KSC2785	
Q115	8-729-922-69	TRANSISTOR KSC2785	
Q116	8-729-922-69	TRANSISTOR KSC2785	
Q119	8-729-922-69	TRANSISTOR KSC2785	
Q120	8-729-922-69	TRANSISTOR KSC2785	
Q121	8-729-922-69	TRANSISTOR KSC2785	
Q122	8-729-922-69	TRANSISTOR KSC2785	
Q123	8-729-922-68	TRANSISTOR KSA1175	
Q201	8-729-922-69	TRANSISTOR KSC2785	
Q205	8-729-922-69	TRANSISTOR KSC2785	
Q301	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q302	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q303	8-729-922-69	TRANSISTOR KSC2785	
Q304	8-729-922-69	TRANSISTOR KSC2785	
Q305	8-729-922-68	TRANSISTOR KSA1175	
Q306	8-729-922-69	TRANSISTOR KSC2785	
Q354	8-729-922-68	TRANSISTOR KSA1175	
Q371	8-729-922-69	TRANSISTOR KSC2785	
Q398	8-729-922-69	TRANSISTOR KSC2785	
Q501	8-729-107-26	TRANSISTOR 2SD1585-K	
Q502	8-729-922-68	TRANSISTOR KSA1175	
Q503	8-729-922-69	TRANSISTOR KSC2785	
Q504	8-729-922-68	TRANSISTOR KSA1175	
Q505	8-729-922-69	TRANSISTOR KSC2785	
Q506	8-729-922-68	TRANSISTOR KSA1175	
Q507	8-729-922-69	TRANSISTOR KSC2785	
Q550	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q551	8-729-821-87	TRANSISTOR 2SD1878-CA	
Q552	8-729-922-69	TRANSISTOR KSC2785	
Q553	8-729-122-12	TRANSISTOR 2SA1221-L	
Q599	8-729-320-62	TRANSISTOR 2SD789-34 (KV-19TR20 ONLY)	
Q601	8-729-255-12	TRANSISTOR 2SC2551-O	
		<RESISTOR>	
R001	1-249-421-11	CARBON 2.2K 5% 1/4W	
R002	1-249-414-11	CARBON 560 5% 1/4W	
R003	1-249-414-11	CARBON 560 5% 1/4W	
R004	1-249-414-11	CARBON 560 5% 1/4W	
R005	1-249-414-11	CARBON 560 5% 1/4W	
R007	1-249-414-11	CARBON 560 5% 1/4W	
R008	1-249-414-11	CARBON 560 5% 1/4W	
R009	1-249-414-11	CARBON 560 5% 1/4W	
R010	1-249-417-11	CARBON 1K 5% 1/4W	
R011	1-249-417-11	CARBON 1K 5% 1/4W	
R013	1-249-414-11	CARBON 560 5% 1/4W	
R014	1-249-421-11	CARBON 2.2K 5% 1/4W	
R015	1-249-421-11	CARBON 2.2K 5% 1/4W	
R016	1-249-421-11	CARBON 2.2K 5% 1/4W	
R017	1-249-421-11	CARBON 2.2K 5% 1/4W	
R018	1-249-416-11	CARBON 820 5% 1/4W	
R019	1-249-429-11	CARBON 10K 5% 1/4W	
R020	1-249-429-11	CARBON 10K 5% 1/4W	
R021	1-249-434-11	CARBON 27K 5% 1/4W	
R022	1-249-414-11	CARBON 560 5% 1/4W	
R023	1-249-414-11	CARBON 560 5% 1/4W	
R026	1-249-421-11	CARBON 2.2K 5% 1/4W	
R027	1-249-421-11	CARBON 2.2K 5% 1/4W	
R028	1-249-423-11	CARBON 3.3K 5% 1/4W	

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

REF.NO.	PART NO.	DESCRIPTION	REMARK
		<SPARK GAP>	
SG501	1-519-422-11	GAP, SPARK	
		<TRANSFORMER>	
T501	⚠ 1-437-090-21	HDT	
T504	⚠ 1-439-483-11	TRANSFORMER ASSY, FLYBACK (NX-1710)	
T599	⚠ 1-421-857-11	TRANSFORMER, FERRITE (KV-19TR20 ONLY)	
T601	⚠ 1-424-335-11	TRANSFORMER, LINE FILTER	
		<THERMISTOR>	
THP601	⚠ 1-808-081-13	THERMISTOR, POSITIVE	
		<TUNER>	
TU101	⚠ 1-465-371-11	TUNER, ET (BTP-RA401) (KV-19TR10 (USA), KV-19TR20 (USA) ONLY)	
	⚠ 1-465-371-21	TUNER, ET (BTP-RA401) (KV-19TR10 (CND), KV-19TR20 (CND) ONLY)	
		<CRYSTAL>	
X101	1-567-192-11	OSCILLATOR, CERAMIC	
X301	1-567-505-11	OSCILLATOR, CRYSTAL	
		**********	
	*A-1331-048-A	C BOARD, COMPLETE	
		**********	
	*1-506-371-00	PIN, CONNECTOR 2P	
	*1-508-768-00	PIN, CONNECTOR (5MM PITCH) 6P	
	1-526-814-11	SOCKET, PICTURE TUBE	
	*1-564-509-11	PLUG, CONNECTOR 6P	
	*4-374-704-01	COVER (REAR LID), CV VOL	
	*4-374-717-01	COVER (MAIN), CV VOL	
		<CAPACITOR>	
C701	1-102-112-00	CERAMIC 330PF 10% 50V	
C702	1-102-112-00	CERAMIC 330PF 10% 50V	
C703	1-102-112-00	CERAMIC 330PF 10% 50V	
C704	1-123-875-11	ELECT 10MF 20% 50V	
C705	1-101-006-00	CERAMIC 0.047MF 50V	
C706	1-123-875-11	ELECT 10MF 20% 50V	
C707	1-129-718-00	FILM 0.022MF 20% 630V	
C708	1-162-116-00	CERAMIC 680PF 10% 2KV	
C711	1-102-116-00	CERAMIC 680PF 10% 50V	
C712	1-102-116-00	CERAMIC 680PF 10% 50V	
C713	1-102-116-00	CERAMIC 680PF 10% 50V	
		<COIL>	
L701	1-408-424-00	INDUCTOR 180UH	
		<TRANSISTOR>	
Q701	8-729-326-11	TRANSISTOR 2SC2611	
Q702	8-729-326-11	TRANSISTOR 2SC2611	
Q703	8-729-326-11	TRANSISTOR 2SC2611	
		<RESISTOR>	
R701	1-249-413-11	CARBON 470 5% 1/4W	
R702	1-249-422-11	CARBON 2.7K 5% 1/4W	
R703	1-249-415-11	CARBON 680 5% 1/4W	
R704	1-249-418-11	CARBON 1.2K 5% 1/4W	
R705	1-249-411-11	CARBON 330 5% 1/4W	
R706	1-249-422-11	CARBON 2.7K 5% 1/4W	
R707	1-249-413-11	CARBON 470 5% 1/4W	
R708	1-249-411-11	CARBON 330 5% 1/4W	
R709	1-249-418-11	CARBON 1.2K 5% 1/4W	
R710	1-249-411-11	CARBON 330 5% 1/4W	
R711	1-249-422-11	CARBON 2.7K 5% 1/4W	
R712	1-249-410-11	CARBON 270 5% 1/4W	
R713	1-249-422-11	CARBON 2.7K 5% 1/4W	
R714	1-249-409-11	CARBON 220 5% 1/4W	
R715	1-202-824-00	SOLID 3.3K 10% 1/2W	
R716	1-215-899-11	METAL OXIDE 15K 5% 2W	F
R717	1-202-824-00	SOLID 3.3K 10% 1/2W	
R718	1-215-899-11	METAL OXIDE 15K 5% 2W	F
R719	1-202-824-00	SOLID 3.3K 10% 1/2W	
R720	1-215-899-11	METAL OXIDE 15K 5% 2W	F
R721	1-249-421-11	CARBON 2.2K 5% 1/4W	
R722	1-202-837-00	SOLID 82K 10% 1/2W	
R723	1-202-846-00	SOLID 470K 10% 1/2W	
R724	1-202-848-00	SOLID 680K 10% 1/2W	
R725	1-202-838-00	SOLID 100K 10% 1/2W	
R726	1-202-719-00	SOLID 1M 10% 1/2W	
R727	1-202-814-11	SOLID 33K 10% 1/2W	
R728	1-216-372-11	METAL OXIDE 1.8 5% 2W	F
R729	1-202-842-11	SOLID 220K 10% 1/2W	
R730	1-202-549-00	SOLID 100 10% 1/2W	
		<VARIABLE RESISTOR>	
RV701	1-228-993-00	RES, ADJ, CARBON 4.7K	
RV702	1-228-991-00	RES, ADJ, CARBON 2.2K	
RV703	1-228-993-00	RES, ADJ, CARBON 4.7K	
RV704	1-228-991-00	RES, ADJ, CARBON 2.2K	
RV705	1-228-993-00	RES, ADJ, CARBON 4.7K	
RV706	1-228-995-00	RES, ADJ, CARBON 22K	
RV707	1-230-641-11	RES, ADJ, METAL GLAZE 2.2M	
RV708	1-230-641-11	RES, ADJ, METAL GLAZE 2.2M	
RV709	⚠ 1-230-619-11	RES, ADJ, METAL GLAZE 110M	
		**********	
	*A-1373-214-A	U BOARD, COMPLETE (KV-19TR20 ONLY)	
		**********	
	*1-565-480-11	CONNECTOR, BOARD TO BOARD 4P	
	*1-565-487-11	CONNECTOR, BOARD TO BOARD 11P	
		<CAPACITOR>	
C401	1-124-119-00	ELECT 330MF 20% 16V	
C402	1-124-119-00	ELECT 330MF 20% 16V	
C403	1-126-320-11	ELECT 10MF 20% 16V	
C408	1-123-875-11	ELECT 10MF 20% 50V	
C414	1-123-875-11	ELECT 10MF 20% 50V	
C415	1-124-477-11	ELECT 47MF 20% 16V	
C451	1-124-119-00	ELECT 330MF 20% 16V	
C452	1-124-791-11	ELECT 1MF 20% 50V	
C461	1-161-742-00	CERAMIC 0.0022MF 20% 400V	
		<DIODE>	
D451	8-719-911-19	DIODE 1SS119	
D452	8-719-911-19	DIODE 1SS119	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION				REMARK
R397	1-249-434-11	CARBON	27K	5%	1/4W	
R398	1-249-423-11	CARBON	3.3K	5%	1/4W	
R501	1-216-458-11	METAL OXIDE	1.8K	5%	2W	F
R502	1-216-458-11	METAL OXIDE	1.8K	5%	2W	F
R503	1-216-458-11	METAL OXIDE	1.8K	5%	2W	F
R504	1-216-458-11	METAL OXIDE	1.8K	5%	2W	F
R505	1-214-780-00	METAL	130K	1%	1/4W	
R506	1-249-407-11	CARBON	150	5%	1/4W	
R507	1-249-426-11	CARBON	5.6K	5%	1/4W	
R508	1-249-437-11	CARBON	47K	5%	1/4W	
R509	1-249-434-11	CARBON	27K	5%	1/4W	
R510	1-249-422-11	CARBON	2.7K	5%	1/4W	
R512	1-249-411-11	CARBON	330	5%	1/4W	F
R513	1-215-472-00	METAL	130K	1%	1/6W	
R514	1-215-457-00	METAL	33K	1%	1/6W	
R515	1-249-427-11	CARBON	6.8K	5%	1/4W	
R516	1-249-428-11	CARBON	8.2K	5%	1/4W	
R517	1-249-417-11	CARBON	1K	5%	1/4W	
R518 ⚠	1-216-379-91	METAL OXIDE	6.8	5%	2W	F
R519	1-249-424-11	CARBON	3.9K	5%	1/4W	
R520	1-249-421-11	CARBON	2.2K	5%	1/4W	
R521	1-249-417-11	CARBON	1K	5%	1/4W	
R522	1-249-431-11	CARBON	15K	5%	1/4W	
R523	1-249-417-11	CARBON	1K	5%	1/4W	
R524	1-249-429-11	CARBON	10K	5%	1/4W	
R525	1-249-417-11	CARBON	1K	5%	1/4W	
R526	1-249-423-11	CARBON	3.3K	5%	1/4W	
R527	1-259-871-15	CARBON	0.8M	5%	1/4W	
R528	1-249-419-11	CARBON	1.5K	5%	1/4W	
R529	1-249-417-11	CARBON	1K	5%	1/4W	
R530	1-249-433-11	CARBON	22K	5%	1/4W	
R531	1-249-410-11	CARBON	270	5%	1/4W	
R532	1-249-438-11	CARBON	56K	5%	1/4W	
R533	1-247-887-00	CARBON	220K	5%	1/4W	
R534	1-249-417-11	CARBON	1K	5%	1/4W	
R535	1-249-431-11	CARBON	15K	5%	1/4W	
R536	1-249-426-11	CARBON	5.6K	5%	1/4W	
R537	1-249-430-11	CARBON	12K	5%	1/4W	
R538	1-249-405-11	CARBON	100	5%	1/4W	
R539	1-215-373-31	METAL	10	1%	1/6W	
R540	1-249-408-11	CARBON	180	5%	1/4W	
R541	1-249-427-11	CARBON	6.8K	5%	1/4W	
R542	1-249-423-11	CARBON	3.3K	5%	1/4W	
R543	1-249-430-11	CARBON	12K	5%	1/4W	
R544	1-249-426-11	CARBON	5.6K	5%	1/4W	
R545	1-249-417-11	CARBON	1K	5%	1/4W	
R547	1-249-429-11	CARBON	10K	5%	1/4W	
R548	1-249-496-11	CARBON	100K	5%	1/2W	
R549	1-249-415-11	CARBON	680	5%	1/4W	F
R550	1-249-429-11	CARBON	10K	5%	1/4W	
R551	1-249-428-11	CARBON	8.2K	5%	1/4W	
R552	1-249-414-11	CARBON	560	5%	1/4W	
R554	1-249-427-11	CARBON	6.8K	5%	1/4W	
R555	1-249-413-11	CARBON	470	5%	1/4W	
R556	1-216-352-11	METAL OXIDE	1.8	5%	1W	F
R557	1-249-411-11	CARBON	330	5%	1/4W	
R558	1-249-410-11	CARBON	270	5%	1/4W	
R559	1-249-409-11	CARBON	220	5%	1/4W	
R560	1-249-423-11	CARBON	3.3K	5%	1/4W	
R561	1-249-496-11	CARBON	100K	5%	1/2W	
R562	1-249-429-11	CARBON	10K	5%	1/4W	
R563	1-249-436-11	CARBON	39K	5%	1/4W	
R564	1-215-417-00	METAL	680	1%	1/6W	
R565	1-249-419-11	CARBON	1.5K	5%	1/4W	
R566	1-247-895-00	CARBON	470K	5%	1/4W	
R567	1-216-399-00	METAL OXIDE	6.8	5%	3W	F
R568 ⚠	1-216-390-51	METAL OXIDE	1.2	5%	3W	F
R569	1-214-913-00	METAL	100K	1%	1/2W	
R570	1-215-869-11	METAL OXIDE	1K	5%	1W	F
R571	1-216-356-00	METAL OXIDE	3.9	5%	1W	F
R572	1-249-423-11	CARBON	3.3K	5%	1/4W	
R573	1-247-764-11	CARBON	10K	5%	1/2W	F
R574	1-216-349-00	METAL OXIDE	1	5%	1W	F
R577 ⚠	1-216-451-91	METAL OXIDE	120	5%	2W	F
R579 ⚠	1-249-415-91	CARBON	680	5%	1/4W	F
R580 ⚠	1-216-428-91	METAL OXIDE	180	5%	1W	F
R581	1-249-413-11	CARBON	470	5%	1/4W	F
R582	1-215-863-11	METAL OXIDE	100	5%	1W	F
R583	1-215-863-11	METAL OXIDE	100	5%	1W	F
R586	1-247-746-11	CARBON	390	5%	1/2W	
R587 ⚠	1-215-899-91	METAL OXIDE	15K	5%	2W	F
R589	1-249-441-11	CARBON	100K	5%	1/4W	
R598	1-249-389-11	CARBON	4.7	5%	1/4W	F (KV-19TR20 ONLY)
R599	1-249-419-11	CARBON	1.5K	5%	1/4W	(KV-19TR20 ONLY)
R601 ⚠	1-202-719-91	SOLID	1M	10%	1/2W	
R602 ⚠	1-205-792-11	WIREWOUND	1.8	5%	10W	F
R605 ⚠	1-205-691-11	WIREWOUND	150	5%	20W	F
R610 ⚠	1-217-224-11	WIREWOUND	100	10%	2W	F
R611	1-215-872-11	METAL OXIDE	3.3K	5%	1W	F
R612	1-205-744-11	WIREWOUND	4.7K	5%	20W	
R613	1-249-437-11	CARBON	47K	5%	1/4W	
R614	1-249-425-11	CARBON	4.7K	5%	1/4W	
R615 ⚠	1-216-463-91	METAL OXIDE	12K	5%	2W	F
R616 ⚠	1-247-719-91	CARBON	3.3K	5%	1/4W	F
R617	1-249-401-11	CARBON	47	5%	1/4W	F
R618	1-247-895-00	CARBON	470K	5%	1/4W	

<VARIABLE RESISTOR>

RV131	1-238-012-11	RES, ADJ, CARBON 1K
RV201	1-238-016-11	RES, ADJ, CARBON 10K
RV306	1-238-012-11	RES, ADJ, CARBON 1K
RV307	1-238-011-11	RES, ADJ, CARBON 470
RV501	1-228-728-00	RES, ADJ, CERAMIC CARBON 100K
RV501	1-228-728-00	RES, ADJ, CERAMIC CARBON 100K
RV502	1-238-020-11	RES, ADJ, CARBON 100K
RV505	1-238-017-11	RES, ADJ, CARBON 22K
RV506	1-238-019-11	RES, ADJ, CARBON 47K
RV507	1-238-010-11	RES, ADJ, CARBON 330

<RELAY>

RY601 ⚠	1-515-573-13	RELAY, POWER

<SWITCH>

S101 ⚠	1-571-532-22	SWITCH, TACTIL (POWER)
S102	1-571-532-21	SWITCH, TACTIL
S103	1-571-532-21	SWITCH, TACTIL
S104	1-571-532-21	SWITCH, TACTIL
S105	1-571-532-21	SWITCH, TACTIL
S106	1-571-532-21	SWITCH, TACTIL (KV-19TR20 ONLY)
S501	1-554-186-00	SWITCH, LEVER

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

REF.NO.	PART NO.	DESCRIPTION				REMARK
		<IC>				
IC401	1-235-783-21	INSULATED MODULE, VIDEO(IVM-1)				
IC402	1-235-784-12	INSULATED MODULE, AUDIO(IAM-1)				
IC406	8-759-000-49	IC MC14066BCP				
		<JACK>				
J451	1-569-354-11	JACK BLOCK, PIN 2P				
		<COIL>				
L401	1-410-515-11	INDUCTOR	33UH			
		<TRANSISTOR>				
Q401	8-729-900-89	TRANSISTOR DTC144ES				
		<RESISTOR>				
R401	1-249-409-11	CARBON	220	5%	1/4W	
R403	1-249-438-11	CARBON	56K	5%	1/4W	
R405	1-249-438-11	CARBON	56K	5%	1/4W	
R406	1-249-405-11	CARBON	100	5%	1/4W	
R409	1-249-441-11	CARBON	100K	5%	1/4W	
R414	1-249-438-11	CARBON	56K	5%	1/4W	
R415	1-249-438-11	CARBON	56K	5%	1/4W	
R418	1-249-405-11	CARBON	100	5%	1/4W	
R420	1-247-885-00	CARBON	180K	5%	1/4W	
R421	1-249-429-11	CARBON	10K	5%	1/4W	
R451	1-249-404-00	CARBON	82	5%	1/4W	
R452	1-247-885-00	CARBON	180K	5%	1/4W	
R453	1-249-437-11	CARBON	47K	5%	1/4W	
R461	1-202-726-00	SOLID	3.9M	10%	1/2W	
		**********				
	*1-632-915-11	K BOARD				
		*******				
	*1-560-123-00	PLUG, CONNECTOR (2.5MM) 3P				
	*1-564-505-11	PLUG, CONNECTOR 2P				
	*1-565-487-11	CONNECTOR, BOARD TO BOARD 11P				
		<CAPACITOR>				
C251	1-124-925-11	ELECT	2.2MF	20%	100V	
C252	1-124-799-11	ELECT	2.2MF	20%	160V	
C253	1-124-667-11	ELECT	10MF	20%	100V	
C255	1-124-910-11	ELECT	47MF	20%	50V	
C256	1-106-375-12	MYLAR	0.022MF	10%	100V	
		<IC>				
IC251	8-749-900-15	IC SI-4102				
		<RESISTOR>				
R251	1-249-434-11	CARBON	27K	5%	1/4W	
R252	1-249-401-11	CARBON	47	5%	1/4W	F
R253	1-249-410-11	CARBON	270	5%	1/4W	F
R254	1-249-430-11	CARBON	12K	5%	1/4W	
		<TRANSFORMER>				
T251	⚠1-427-479-11	TRANSFORMER (SOT)				
		**********				
		MISCELLANEOUS				
		**********				
	⚠1-426-358-11	COIL, DEMAGNETIZATION				
	⚠1-451-260-22	DEFLECTION YOKE (Y20NDA)				
	1-452-032-00	MAGNET, DISK; 10MM φ				
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM φ				
	1-452-277-00	MAGNET, BMC				
	⚠1-536-678-31	ANTENNA BLOCK (KV-19TR10 (USA), KV-19TR20 (USA) ONLY)				
	⚠1-537-077-21	ANTENNA BLOCK (KV-19TR10 (CND), KV-19TR20 (CND) ONLY)				
	⚠1-559-396-11	CORD, POWER				
SP902	1-544-283-11	SPEAKER				
V901	⚠8-737-353-05	PICTURE TUBE (A49JLV50X)				

****

ACCESSORIES AND PACKING MATERIALS
****

PART NO.	DESCRIPTION	REMARK
1-465-385-11	REMOTE COMMANDER (RM-781) (KV-19TR20 ONLY)	
1-465-386-11	REMOTE COMMANDER (RM-780) (KV-19TR10 ONLY)	
1-501-372-21	ANTENNA, TELESCOPIC (KV-19TR10 (USA), KV-19TR20 (USA) ONLY)	
1-513-379-00	CONVERTER (EAC-25) (KV-19TR10 (CND), KV-19TR20 (CND) ONLY)	
1-562-443-11	CONNECTOR, ANTENNA (KV-19TR10 (USA), KV-19TR20 (USA) ONLY)	
3-751-226-21	MANUAL, INSTRUCTION	
3-751-226-31	MANUAL, INSTRUCTION (KV-19TR10 (CND), KV-19TR20 (CND) ONLY)	
*4-380-340-01	BAG, PROTECTION	
*4-397-482-01	CUSHION (UPPER) (ASSY)	
*4-397-483-01	CUSHION (LOWER) (ASSY)	
*4-397-484-01	INDIVIDUAL CARTON	

KV-19TR10/19TR20
RM-780/RM-781

SONY

SERVICE MANUAL

US Model

KV-19TR10

Chassis No. SCC-D37E-A

KV-19TR20

Chassis No. SCC-D37F-A

Canadian Model

KV-19TR10

Chassis No. SCC-D36C-A

KV-19TR20

Chassis No. SCC-D36B-A

CORRECTION-1

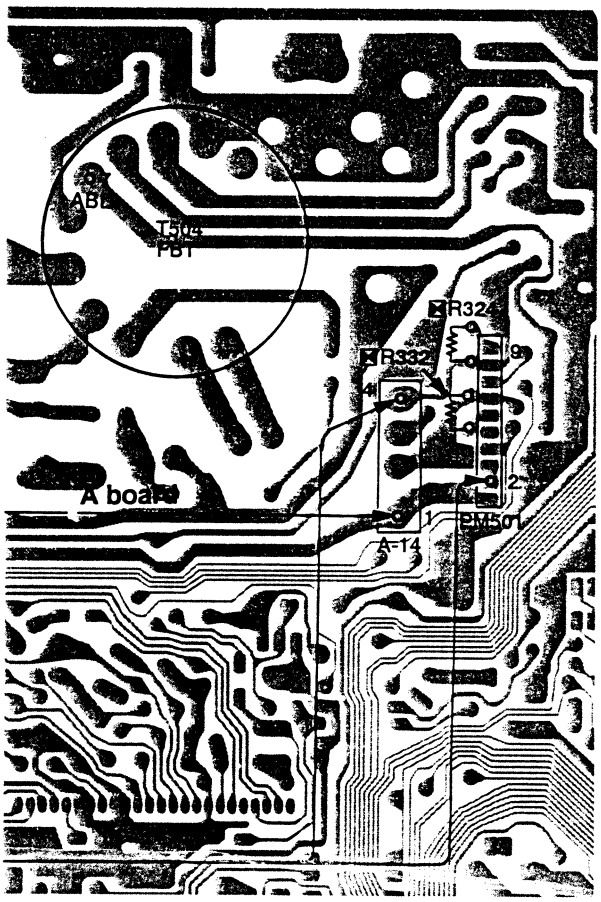
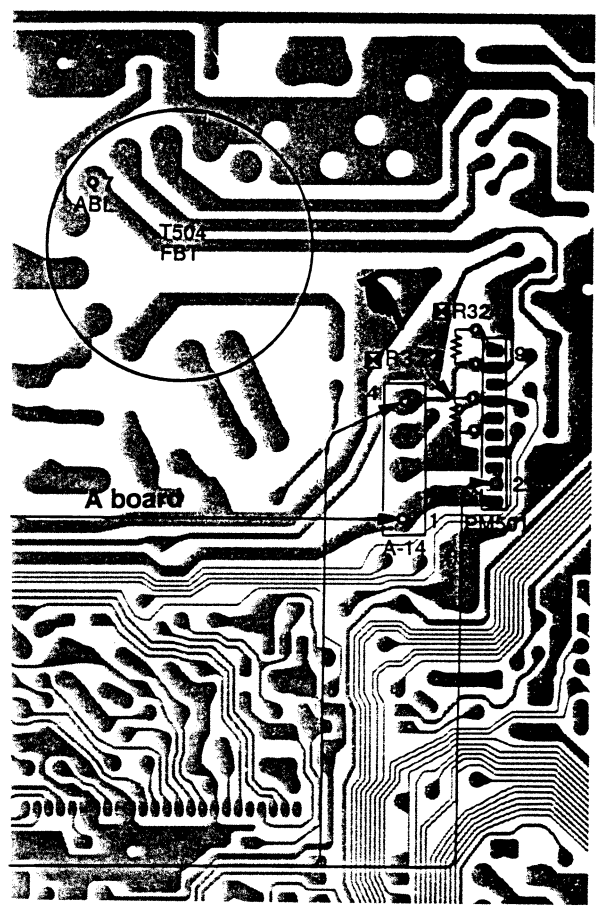
Correct the service manual as shown below.

File this correction with the service manual.

☛ : Indicates corrected portion

SECTION 4

SAFETY RELATED ADJUSTMENTS

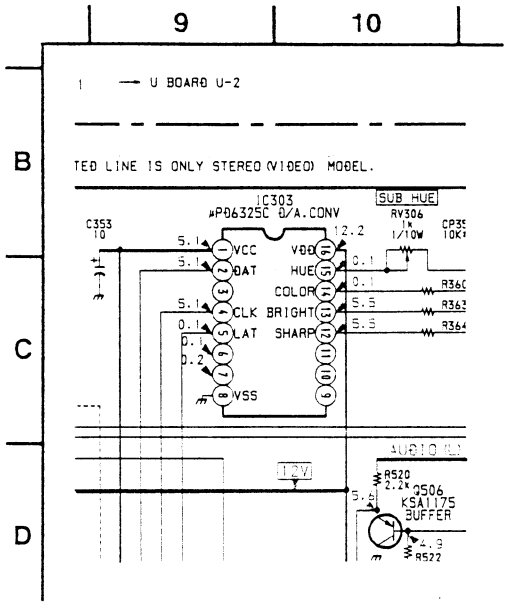
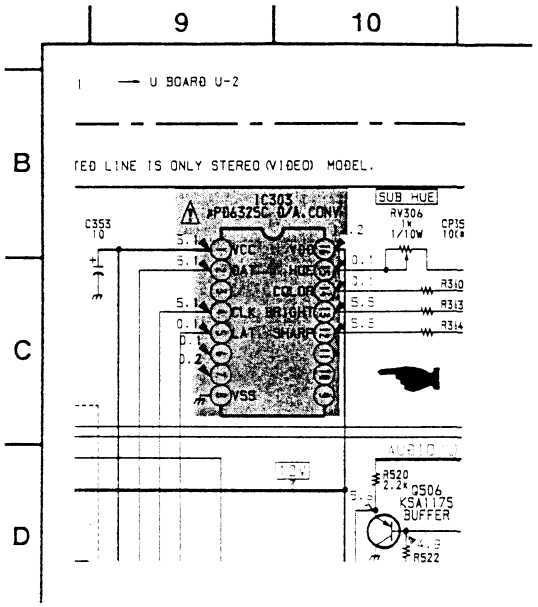
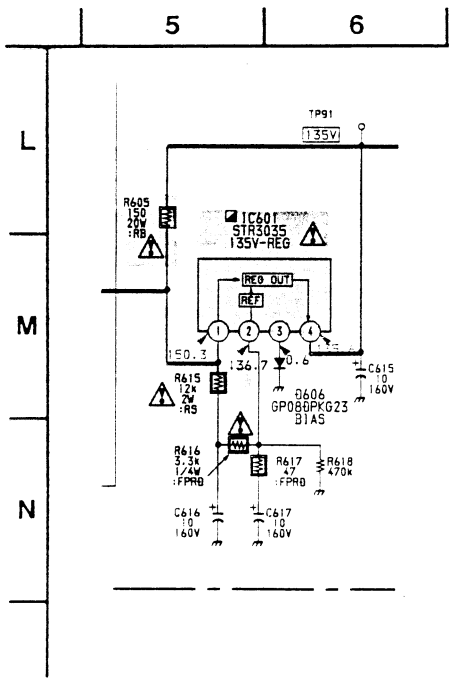
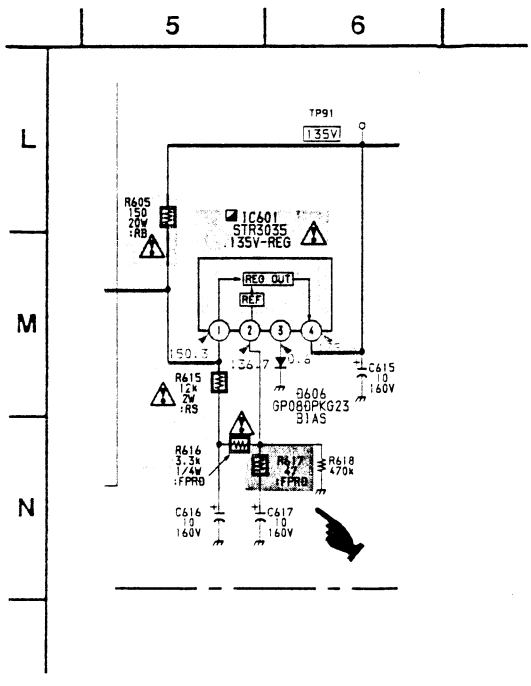
Page	Incorrect	Correct
16		

SECTION 6 DIAGRAMS

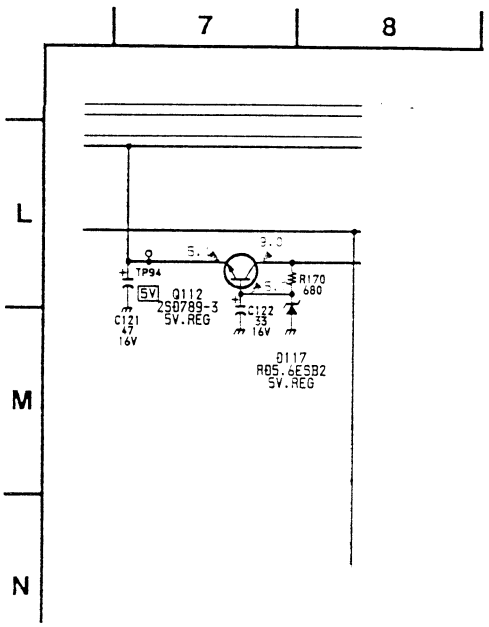
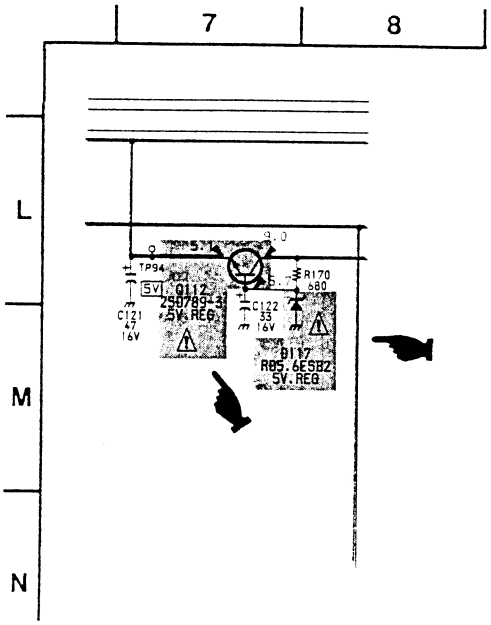
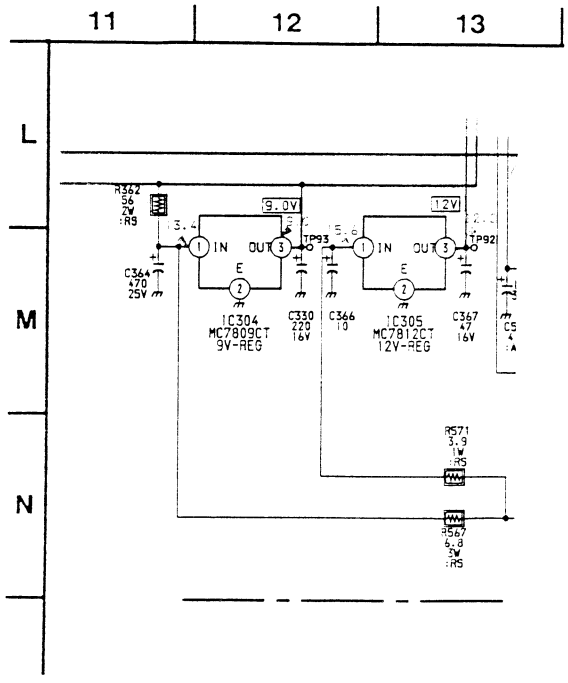
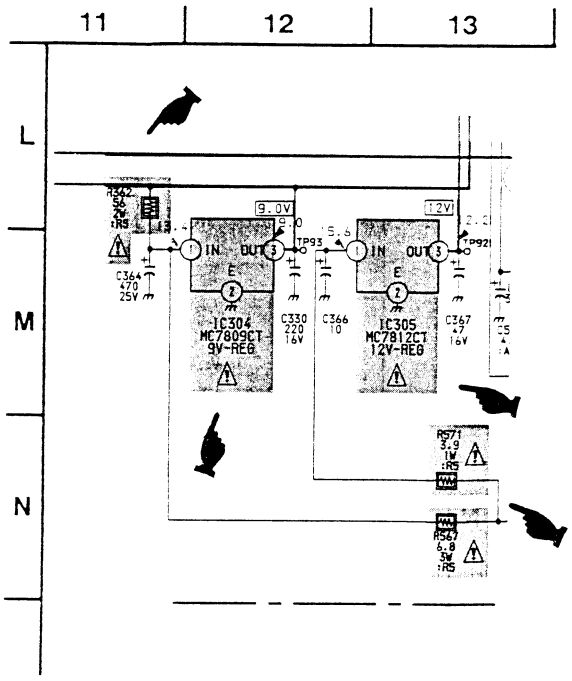
6-2 PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS TO CIRCUIT NOTE

Page	Incorrect	Correct
19	• Readings are taken with a color-bar signal input. • Readings are taken with a 10 MΩ digital maltimeter. • Voltage are dc with respect to ground unless otherwise noted. • Voltage variations may be neted due to normal production tolerances. • ▬▬ : B+ bus. • ⇒ : signal path.	• Readings are taken with a color-bar signal input. • Readings are taken with a 10 MΩ digital maltimeter. • Voltage are dc with respect to ground unless otherwise noted. • Voltage variations may be neted due to normal production tolerances. • ▬▬ : B+ bus. • ⇒ : signal path. • * : Model difference ☛

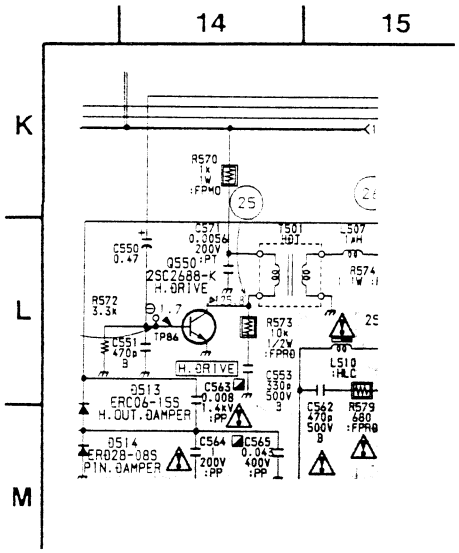
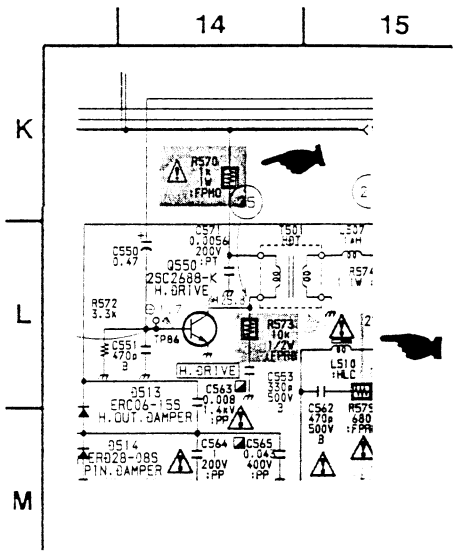
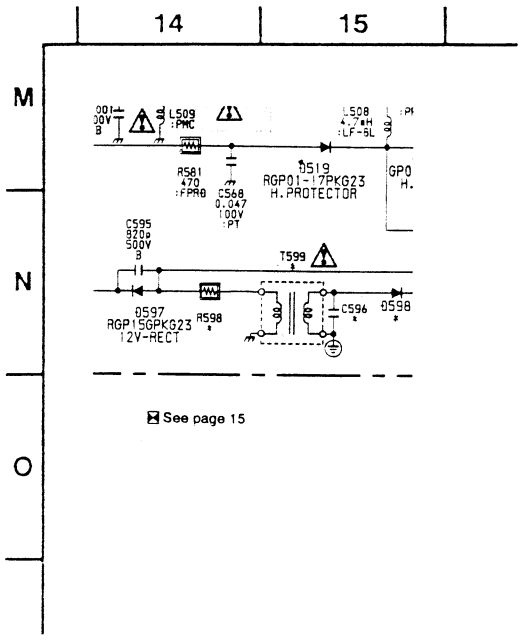
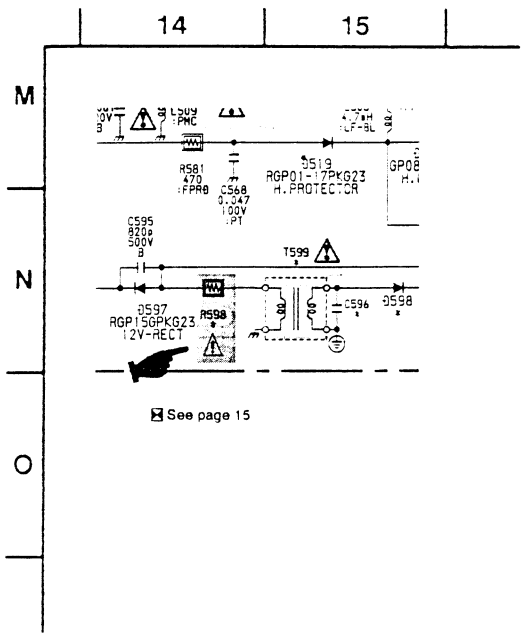
6-2 SCHEMATIC DIAGRAMS (A BOARD)

Page	Incorrect	Correct
20		
20		

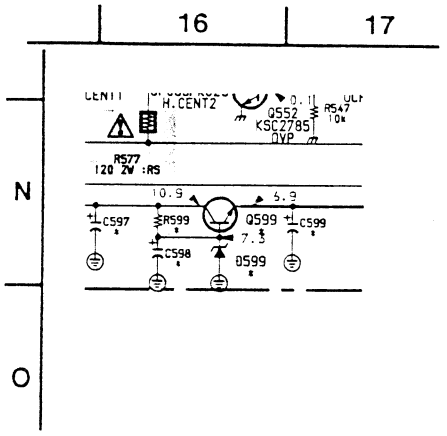
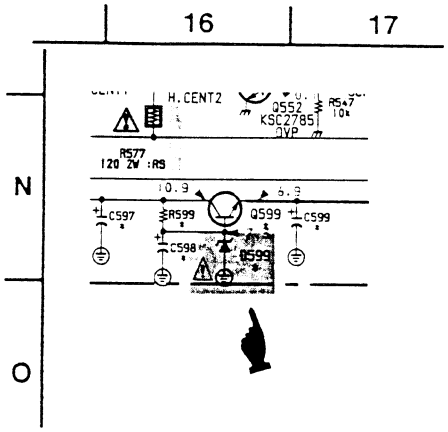
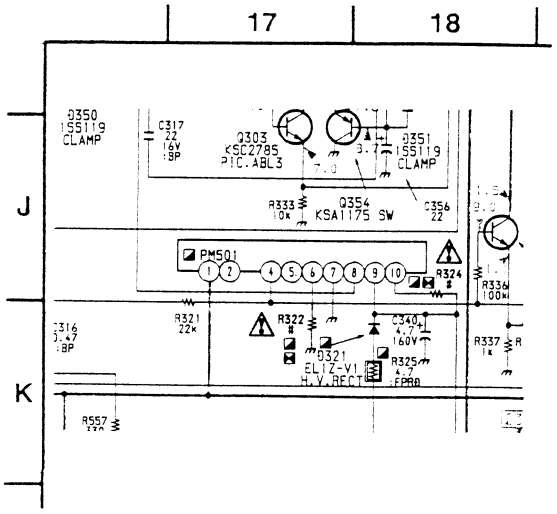
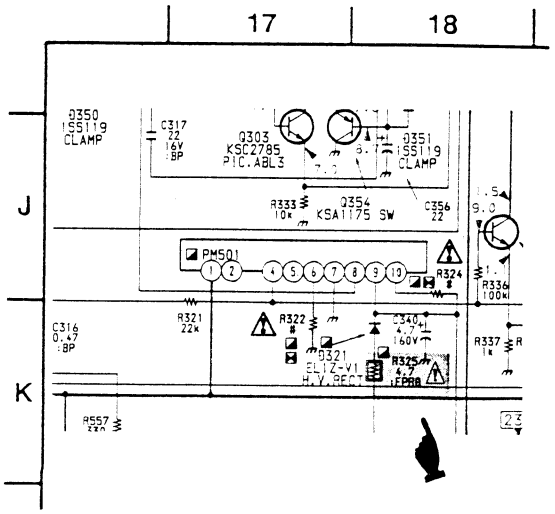
6-2 SCHEMATIC DIAGRAMS (A BOARD)

Page	Incorrect	Correct
20		
21		

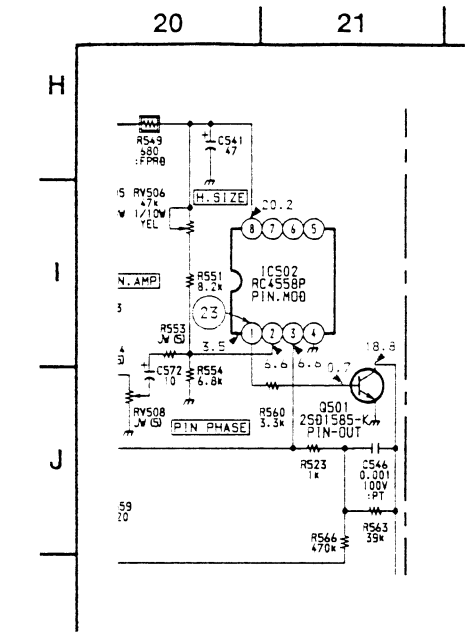
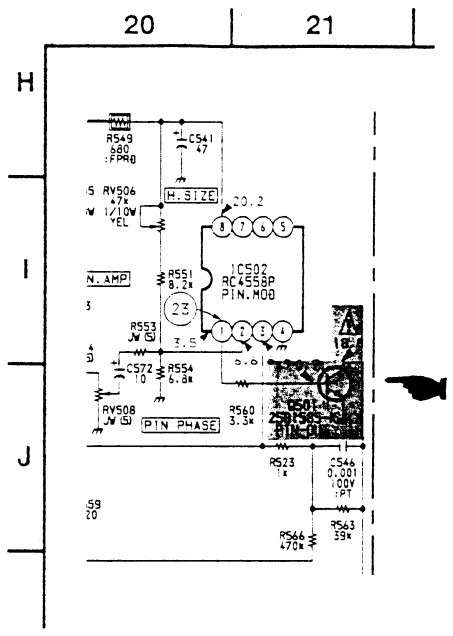
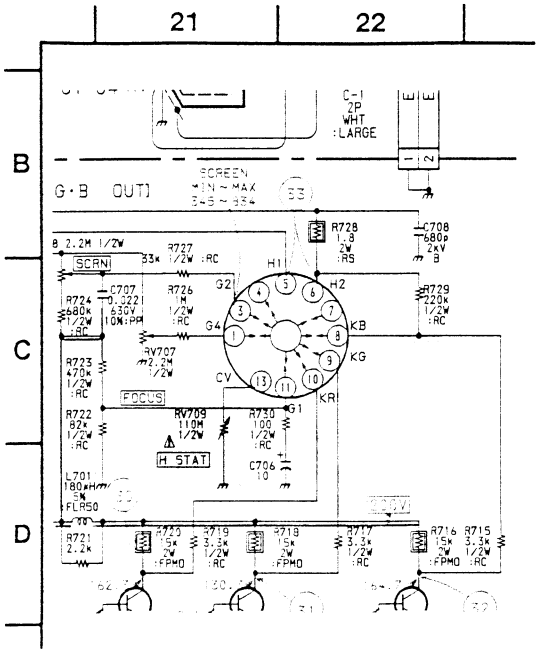
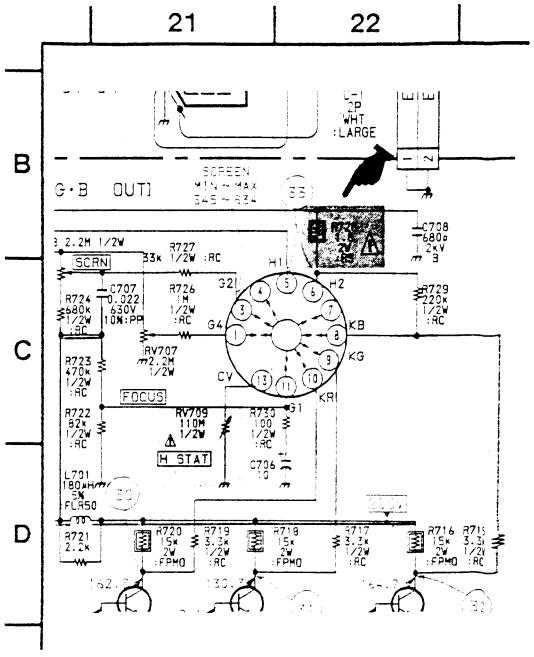
6-2 SCHEMATIC DIAGRAMS (A BOARD)

Page	Incorrect	Correct
21		
21	 See page 15	 See page 15

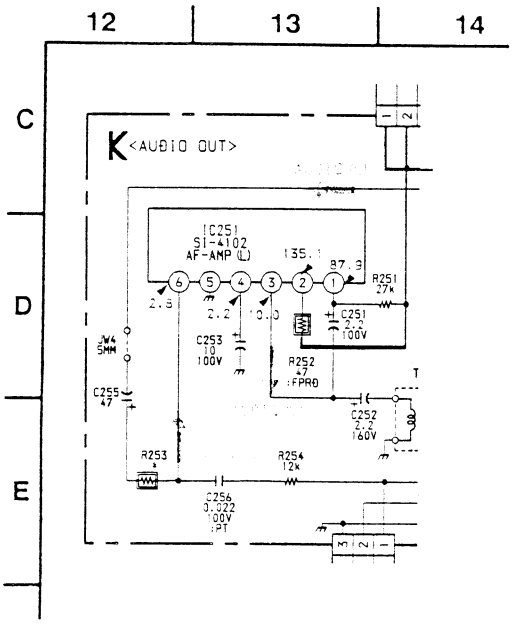
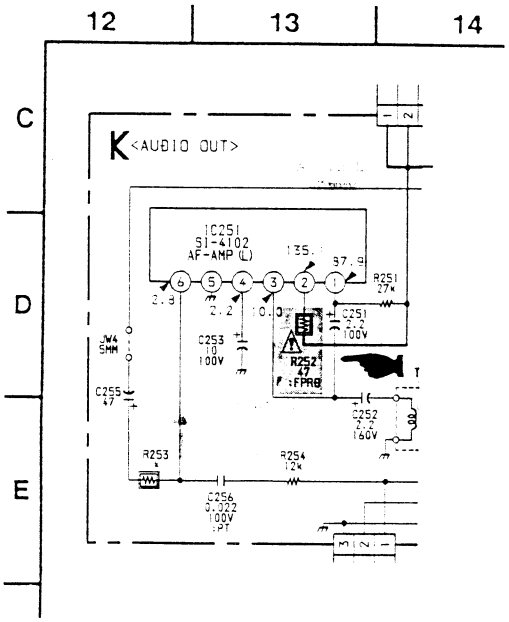
6-2 SCHEMATIC DIAGRAMS (A BOARD)

Page	Incorrect	Correct
21		
21		

6-2 SCHEMATIC DIAGRAMS (A,C BOARD)

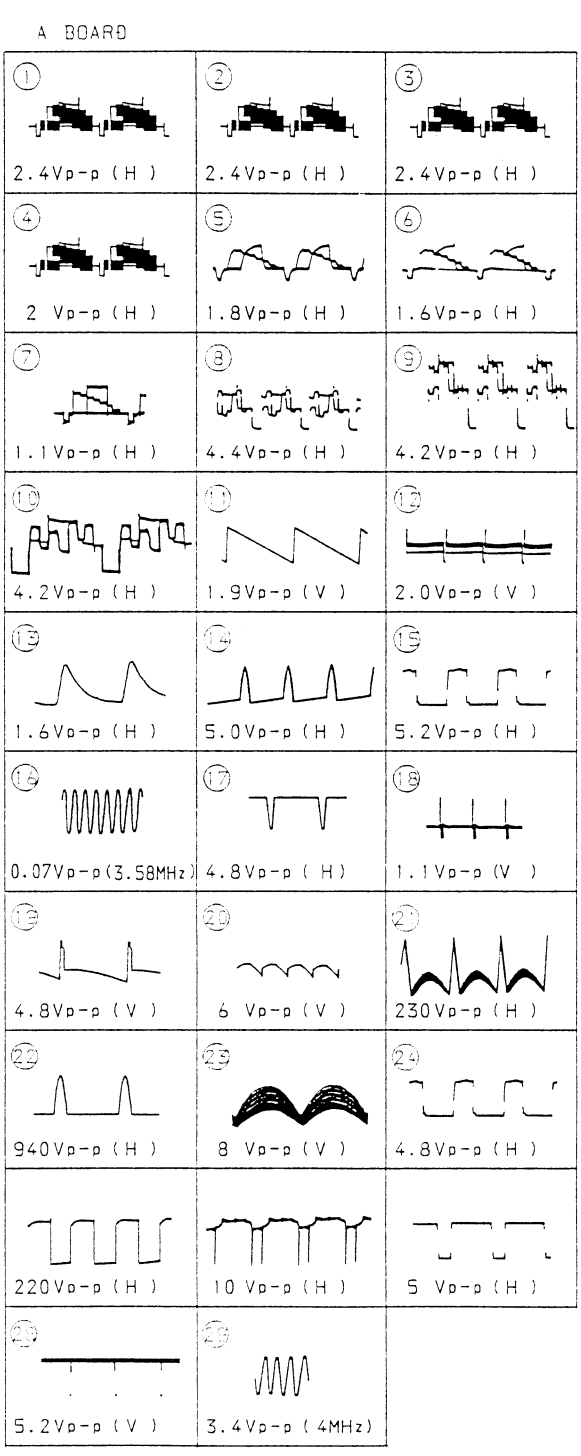
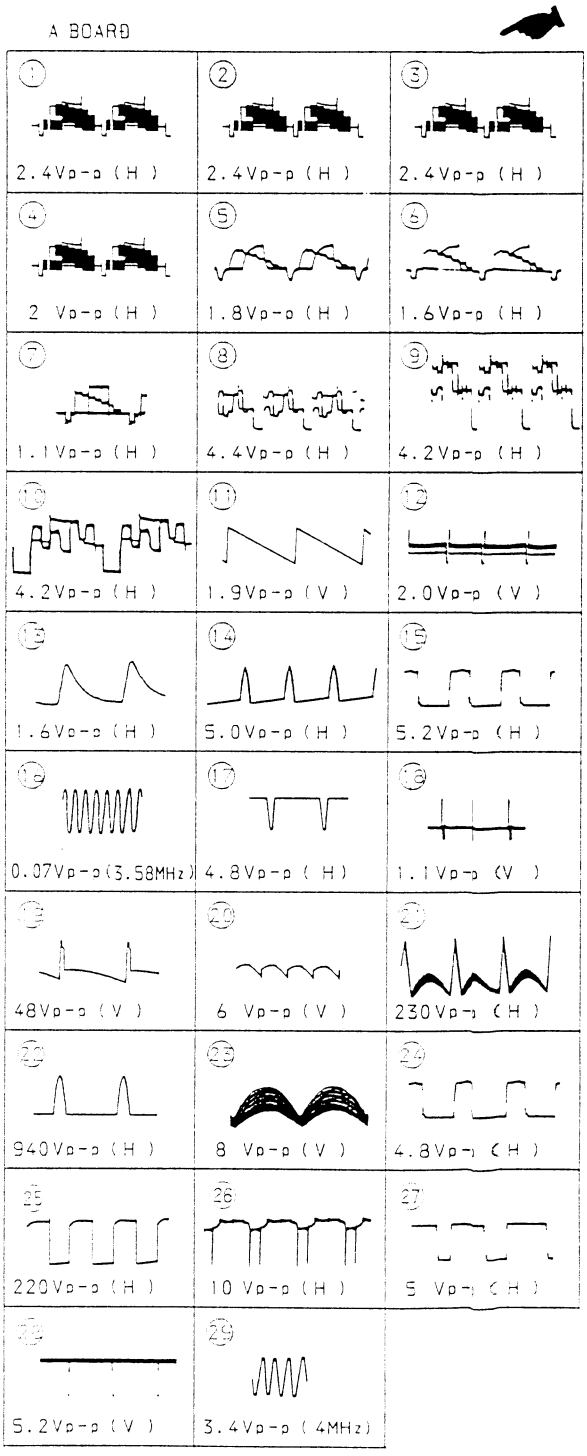
Page	Incorrect	Correct
22		
22		

6-2 SCHEMATIC DIAGRAMS (K BOARD)

Page	Incorrect	Correct
27		

6-2 SCHEMATIC DIAGRAMS (A BOARD)

A board waveform

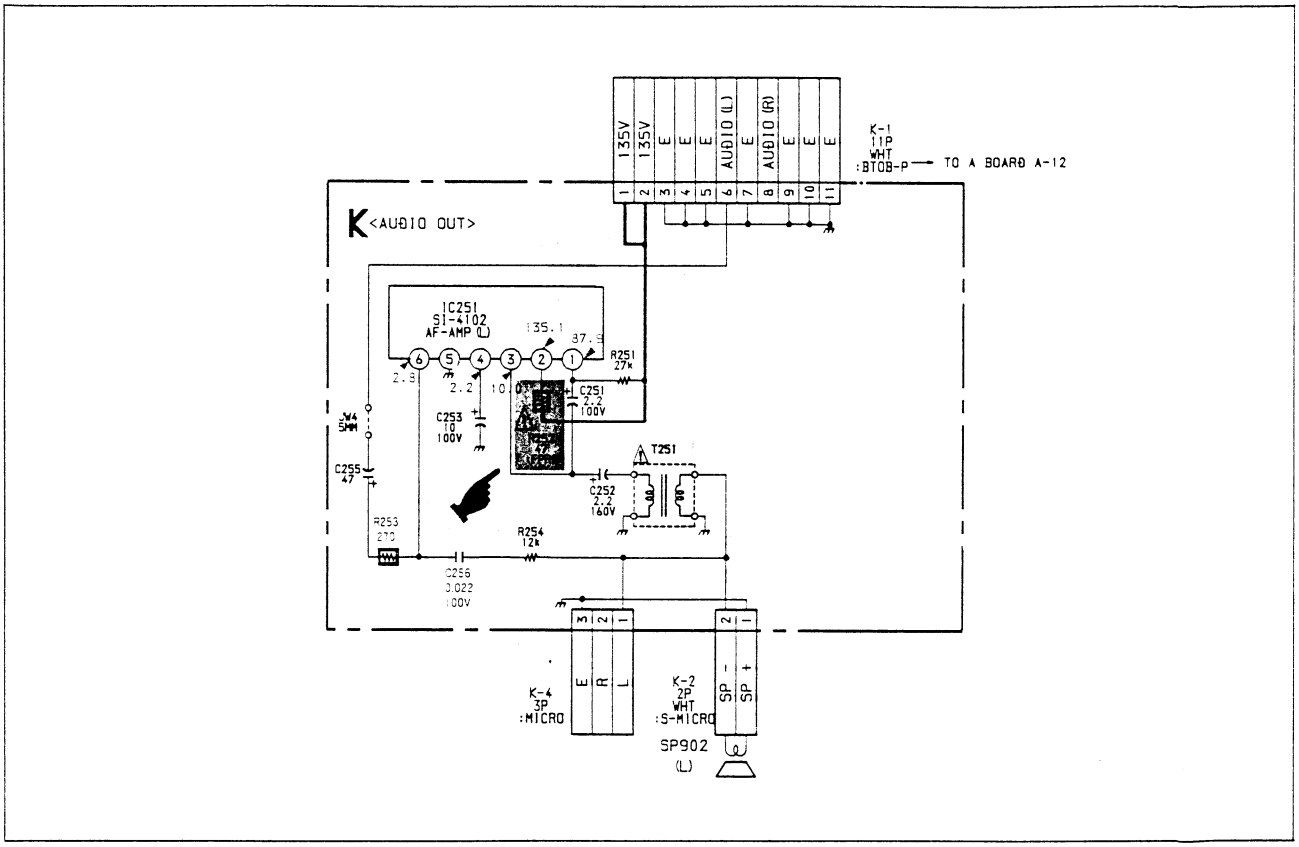
Page	Incorrect	Correct
22		

6-2 SCHEMATIC DIAGRAMS (A BOARD)

Circuit Board A Difference List(P19-P22)

Location	Ref,No	KV-19TR10	KV-19TR20
N-20	A-3	–	CONECTOR, BOARD TO BOARD 4P
C-5	C214	10MF 16V	–
M-14	C563	0.008 2KV	–
E-7	C351	–	47MF 16V
E-7	C352	–	47MF 16V
N-15	C596	–	0.0033MF 630V
N-16	C597	–	220MF 35V
N-16	C598	–	33MF 16V
N-16	C599	–	220MF 16V
J-2	D151	ISS119	–
N-16	D599	–	RD10ES-B2
N-15	D598	–	RH-1C
E-8	IC302	–	CX20061
N-16	Q599	–	2SD789-4
E-7	R354	–	100
E-7	R355	–	22K
D-7	R356	–	100
E-8	R357	–	100
N-14	R598	–	4.7
N-16	R599	–	1.5K
N-15	T599	–	TRANSFORMER, FERRITE

6-2 SCHEMATIC DIAGRAMS(Page27-28) (K board)



SECTION 8
ELECTRICAL PARTSLIST

Page		Incorrect	Correct
32		D117 8-719-109-89 DIODE RD5.6ES-B2	⚠ D117 8-719-109-89 DIODE RDS6ES-B2
		D599 8-719-110-17 DIODE RD10ES-B2	⚠ D599 8-719-110-17 DIODE RD10ES-B2
		IC303 8-759-104-05 IC μPD6325C	⚠ IC303 8-759-104-05 IC μPD6325C
		IC304 8-759-982-10 IC RC7809FA	⚠ IC-304 8-759-030-99IC MC7809CT
		IC305 8-759-013-09 IC MC7812CT	⚠ IC305 8-759-013-09 IC MC7812CT
		Q112 8-729-300-62 TRANSISTOR 2SD789-34	⚠ Q112 8-729-378-91 TRANSISTOR 2SD789-3
|	A	Q501 8-729-107-26 TRANSISTOR 2SD1585-K	⚠ Q501 8-729-107-26 TRANSISTOR 2SD1585-K
35		R325 1-249-389-11 CARBON 4.7 1/4W	⚠ R325 1-249-389-91 CARBON 4.7 1/4W
		R362 1-215-907-11 METAL OXIDE 22 3W	⚠ R362 1-215-907-51 METAL OXIDE 22 3W
		R567 1-216-399-00 METAL OXIDE 6.8 3W	⚠ R567 1-216-399-51 METAL OXIDE 6.8 3W
		R570 1-215-869-11 METAL OXIDE 1K 1W	⚠ R570 1-213-143-61 METAL OXIDE 1K 1W
		R571 1-216-356-00 METAL OXIDE 3.9 1W	⚠ R571 1-216-356-91 METAL OXIDE 3.9 1W
		R573 1-247-764-11 CARBON 10K 1/2W	⚠ R573 1-247-764-91 CARBON 10K 1/2W
		R598 1-249-389-11 CARBON 4.7 1/4W	⚠ R598 1-249-389-91 CARBON 4.7 1/4W
		R617 1-249-401-11 CARBON 47 1/4W	⚠ R617 1-249-401-91 CARBON 47 1/4W
36	C	R728 1-216-372-11 METAL OXIDE 1.8 2W	⚠ R728 1-216-372-51 META OXIDE 1.8 2W
37	K	C252 1-124-799-11 ELECT 2.2MF 160V	⚠ C252 1-123-930-91 ELECT 2.2MF 160V

9-964-499-91

Sony Corporation
TV Group

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90FE1850-1
Printed in Japan